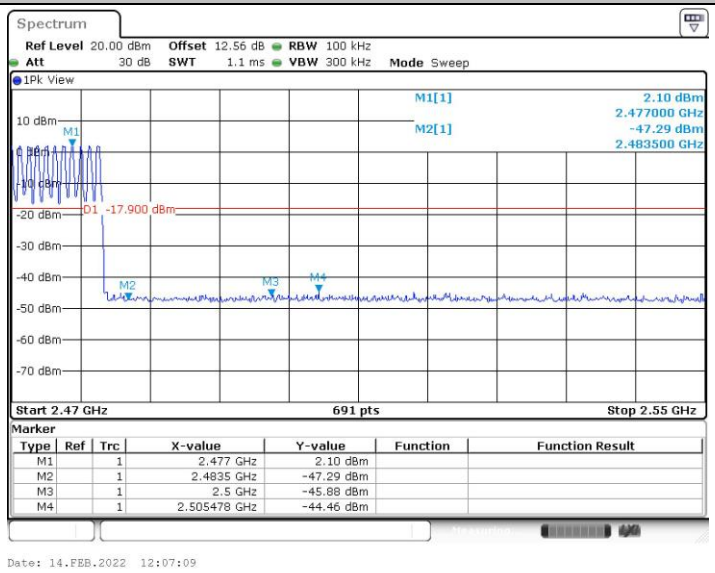
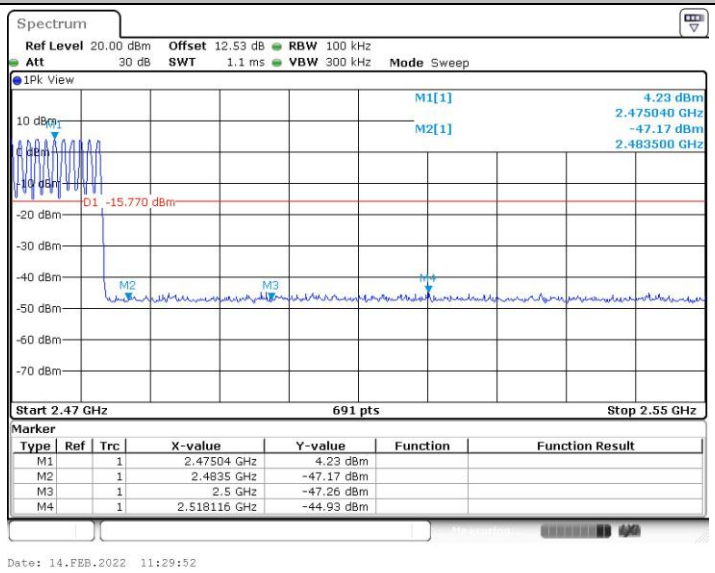
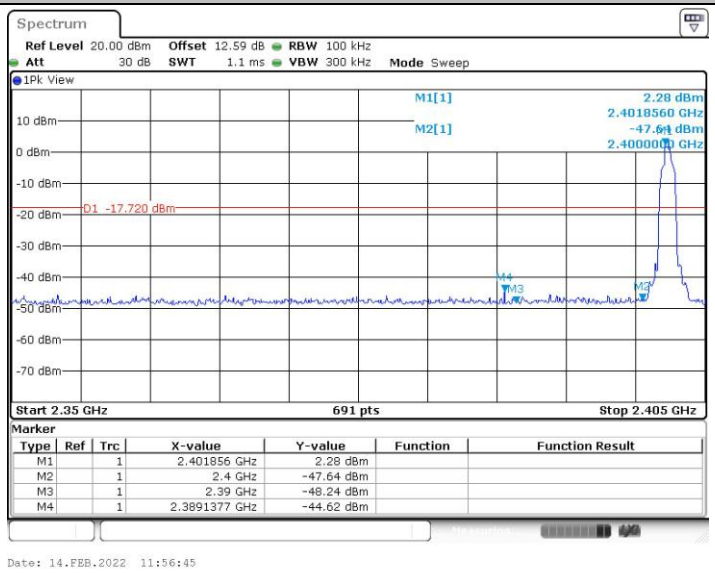
DH5_Ant1_High_Hop_2480



DH5_Ant2_High_Hop_2480



2DH1_Ant1_Low_2402



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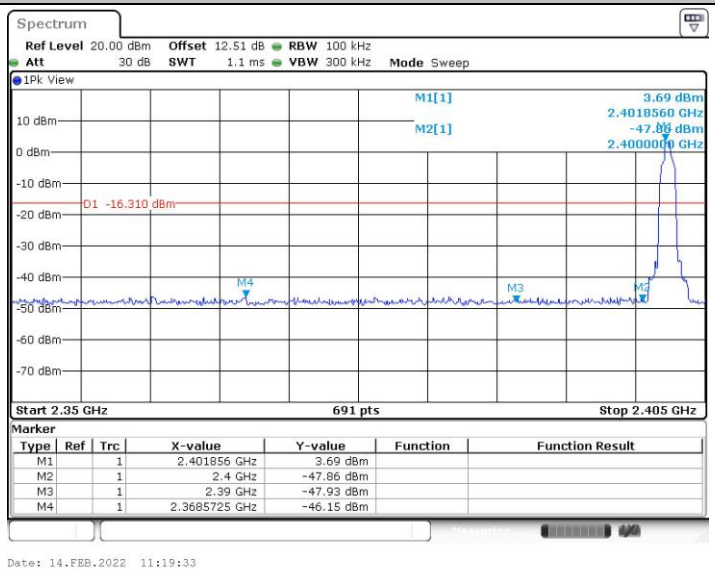
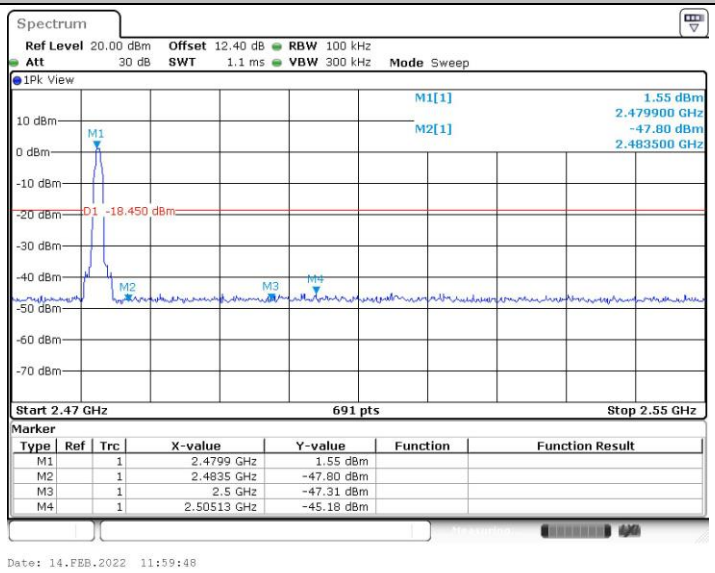


2DH1_Ant1_High_2480



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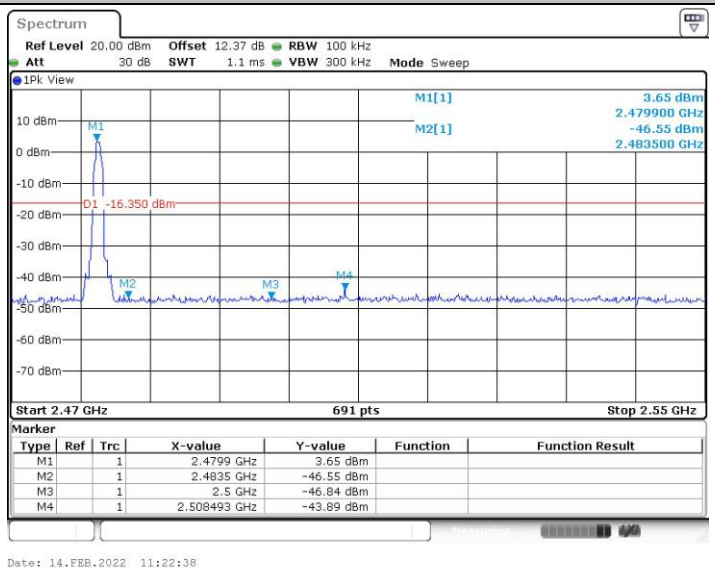
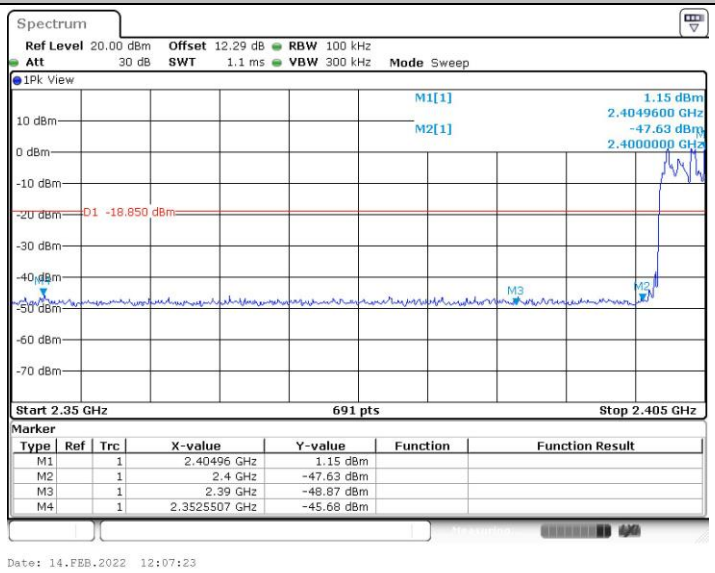
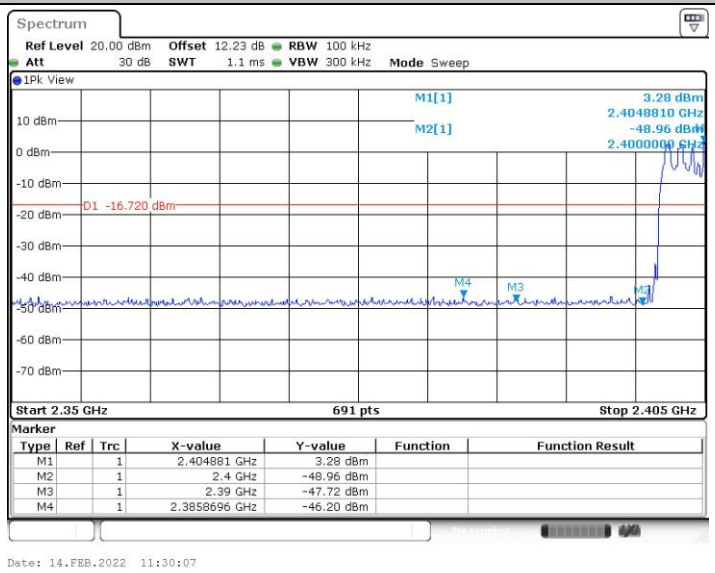


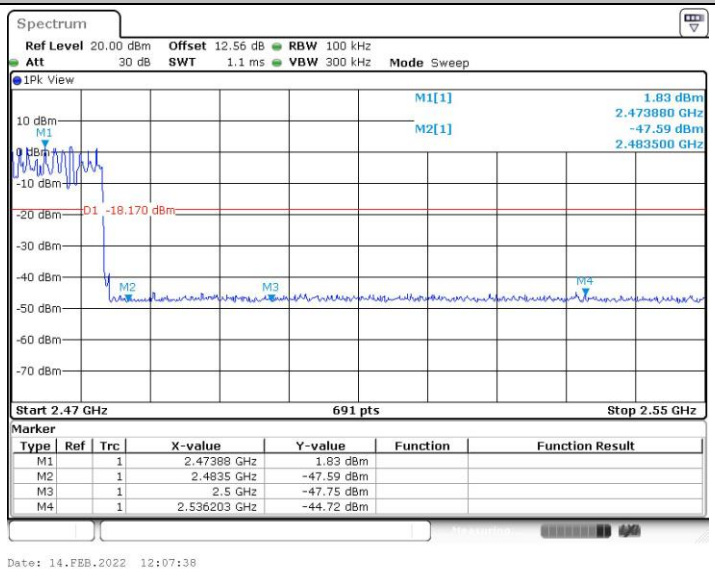
2DH1_Ant1_Low_Hop_2402



2DH1_Ant2_Low_Hop_2402



2DH1_Ant1_High_Hop_2480



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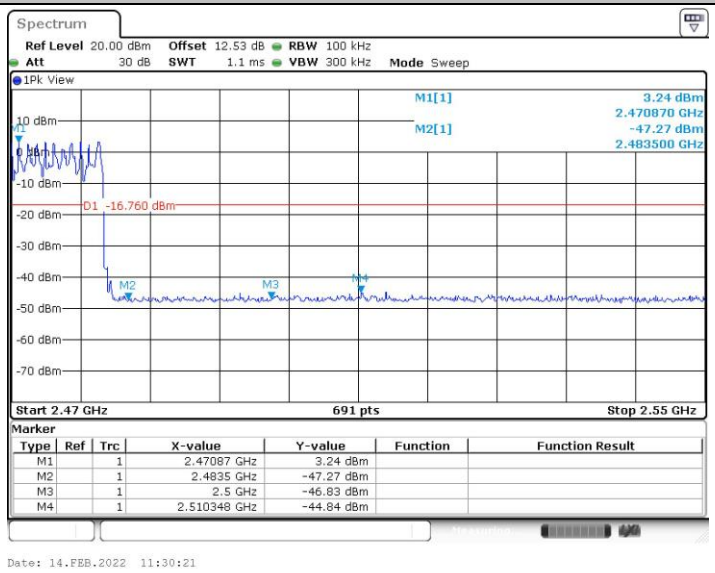
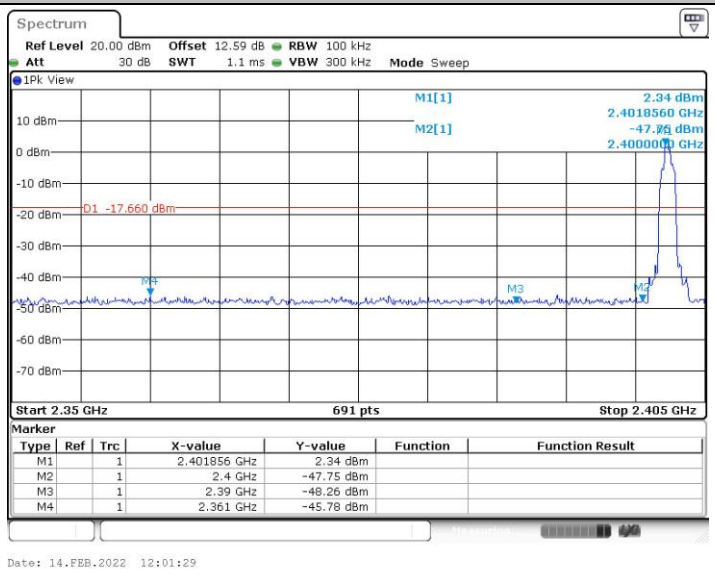


3DH1_Ant1_Low_2402



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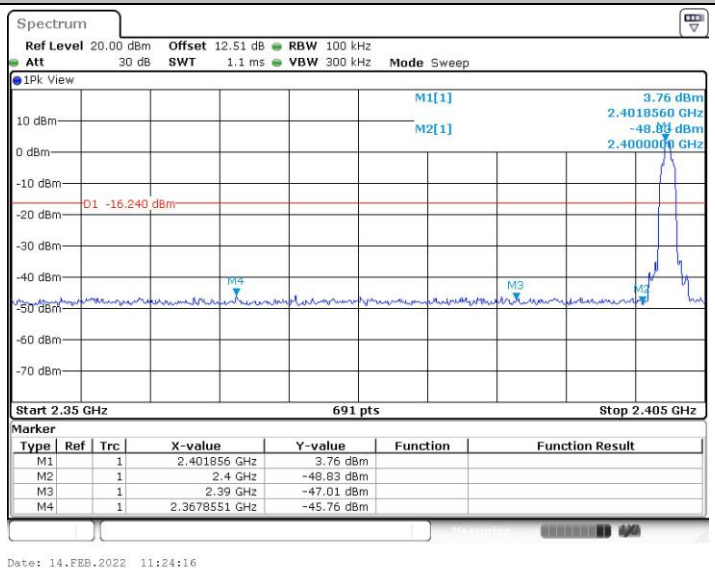
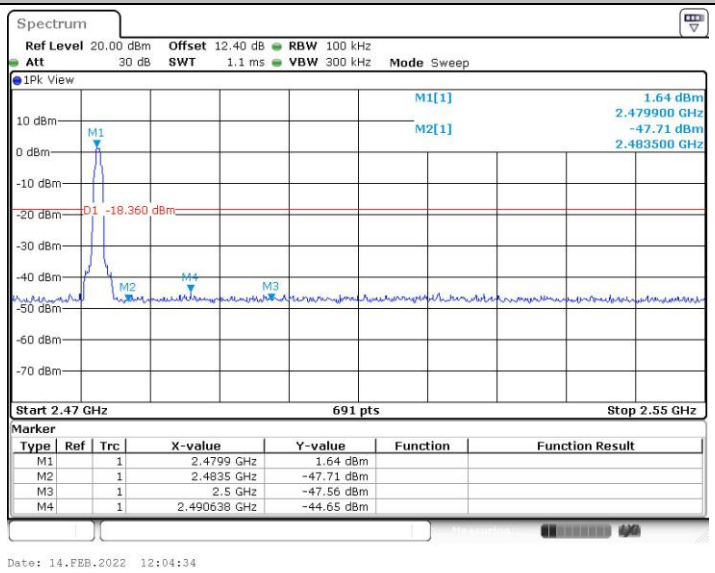


3DH1_Ant1_High_2480



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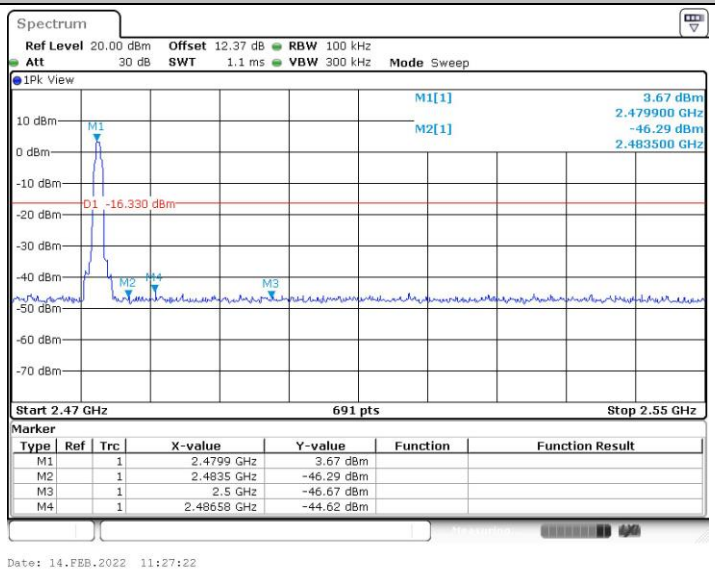
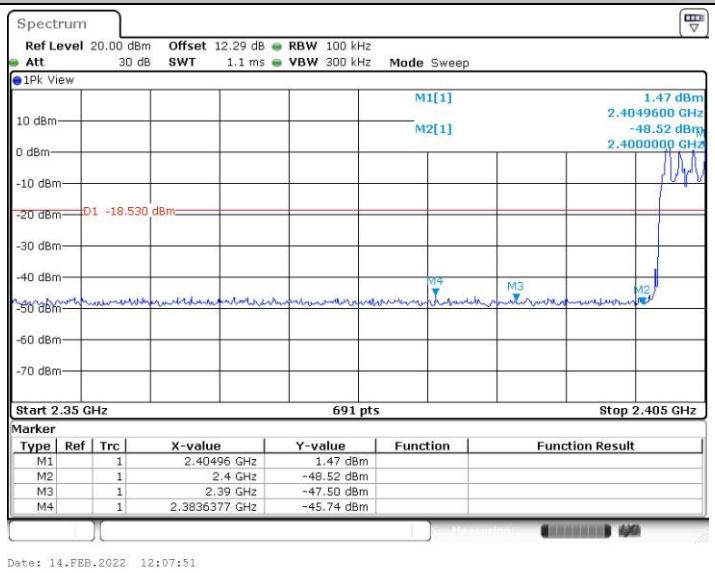


3DH1_Ant1_Low_Hop_2402



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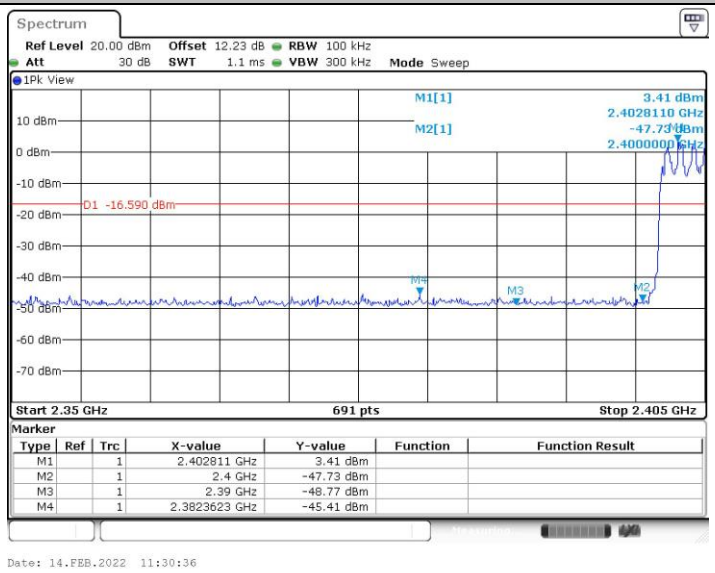
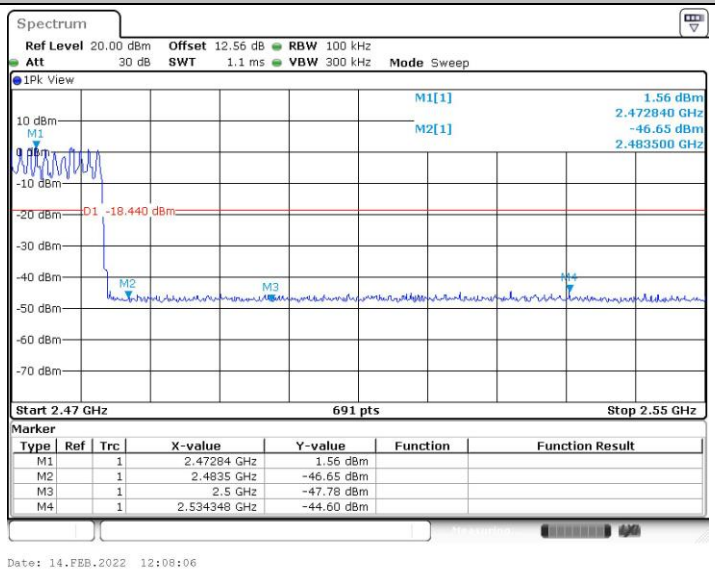
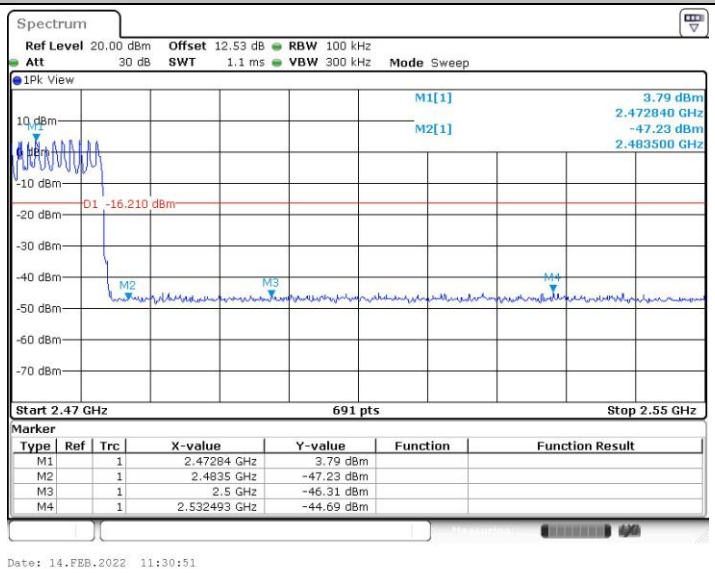


3DH1_Ant1_High_Hop_2480



3DH1_Ant2_High_Hop_2480



Conducted Spurious Emission

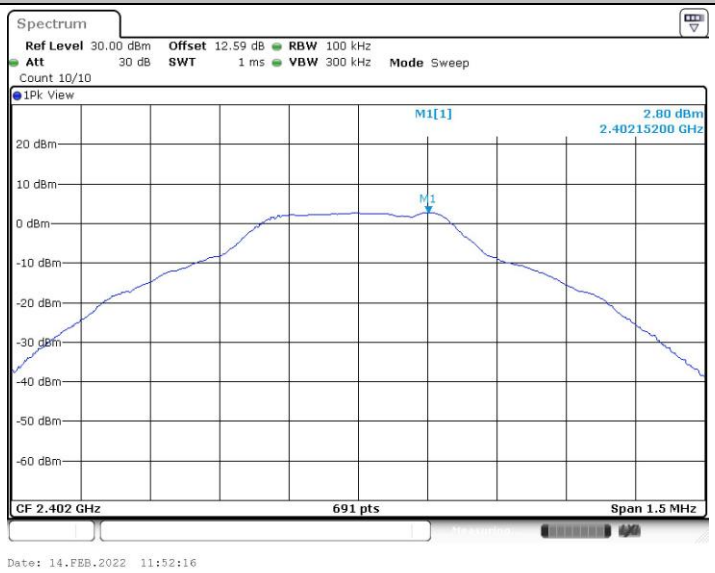
Test Result

Test Mode	Antenna	Frequency [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	2.80	2.80	---	PASS
			30~1000	2.80	-55.86	≤-17.2	PASS
			1000~26500	2.80	-47.17	≤-17.2	PASS
	Ant2	2402	Reference	4.22	4.22	---	PASS
			30~1000	4.22	-57.01	≤-15.78	PASS
			1000~26500	4.22	-46.97	≤-15.78	PASS
	Ant1	2441	Reference	2.63	2.63	---	PASS
			30~1000	2.63	-56.35	≤-17.37	PASS
			1000~26500	2.63	-48	≤-17.37	PASS
	Ant2	2441	Reference	4.44	4.44	---	PASS
			30~1000	4.44	-55.95	≤-15.56	PASS
			1000~26500	4.44	-47.59	≤-15.56	PASS
	Ant1	2480	Reference	2.05	2.05	---	PASS
			30~1000	2.05	-56.24	≤-17.95	PASS
			1000~26500	2.05	-47.41	≤-17.95	PASS
	Ant2	2480	Reference	4.14	4.14	---	PASS
			30~1000	4.14	-56.63	≤-15.86	PASS
			1000~26500	4.14	-47.36	≤-15.86	PASS
2DH1	Ant1	2402	Reference	2.19	2.19	---	PASS
			30~1000	2.19	-56.71	≤-17.81	PASS
			1000~26500	2.19	-47.66	≤-17.81	PASS
	Ant2	2402	Reference	3.59	3.59	---	PASS
			30~1000	3.59	-56.28	≤-16.41	PASS
			1000~26500	3.59	-47.36	≤-16.41	PASS
	Ant1	2441	Reference	2.06	2.06	---	PASS
			30~1000	2.06	-55.96	≤-17.94	PASS
			1000~26500	2.06	-47.37	≤-17.94	PASS
	Ant2	2441	Reference	3.84	3.84	---	PASS
			30~1000	3.84	-56.51	≤-16.16	PASS
			1000~26500	3.84	-47.47	≤-16.16	PASS
	Ant1	2480	Reference	1.49	1.49	---	PASS
			30~1000	1.49	-57	≤-18.51	PASS
			1000~26500	1.49	-47.19	≤-18.51	PASS
	Ant2	2480	Reference	3.56	3.56	---	PASS
			30~1000	3.56	-56.69	≤-16.44	PASS
			1000~26500	3.56	-46.86	≤-16.44	PASS

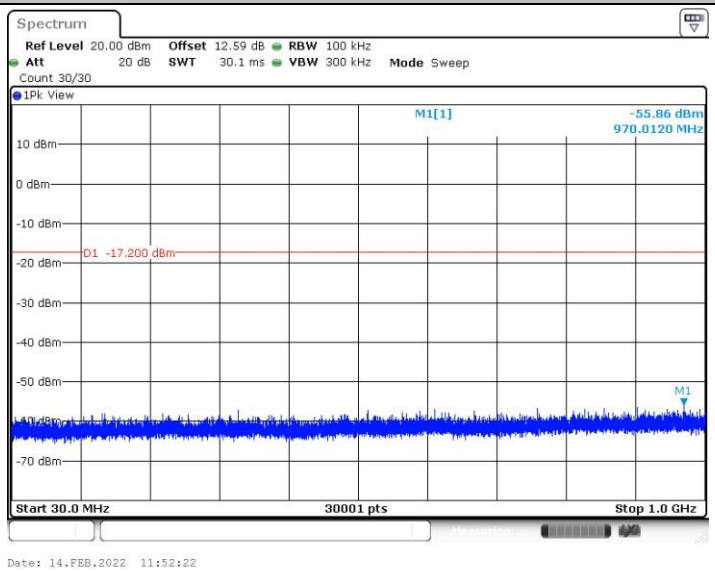
Test Mode	Antenna	Frequency [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
3DH1	Ant1	2402	Reference	2.28	2.28	---	PASS
			30~1000	2.28	-56.25	≤-17.72	PASS
			1000~26500	2.28	-46.93	≤-17.72	PASS
	Ant2	2402	Reference	3.71	3.71	---	PASS
			30~1000	3.71	-56.29	≤-16.29	PASS
			1000~26500	3.71	-47.69	≤-16.29	PASS
	Ant1	2441	Reference	2.17	2.17	---	PASS
			30~1000	2.17	-56.75	≤-17.83	PASS
			1000~26500	2.17	-47.51	≤-17.83	PASS
	Ant2	2441	Reference	3.94	3.94	---	PASS
			30~1000	3.94	-56.12	≤-16.06	PASS
			1000~26500	3.94	-47.84	≤-16.06	PASS
	Ant1	2480	Reference	1.62	1.62	---	PASS
			30~1000	1.62	-56.19	≤-18.38	PASS
			1000~26500	1.62	-47.28	≤-18.38	PASS
	Ant2	2480	Reference	3.67	3.67	---	PASS
			30~1000	3.67	-56.71	≤-16.33	PASS
			1000~26500	3.67	-48.34	≤-16.33	PASS

Test Graphs

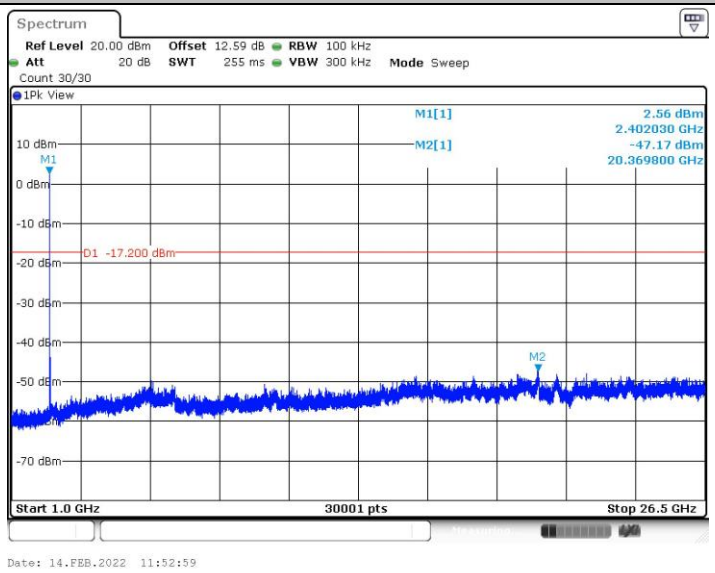
DH5_Ant1_2402_0~Reference



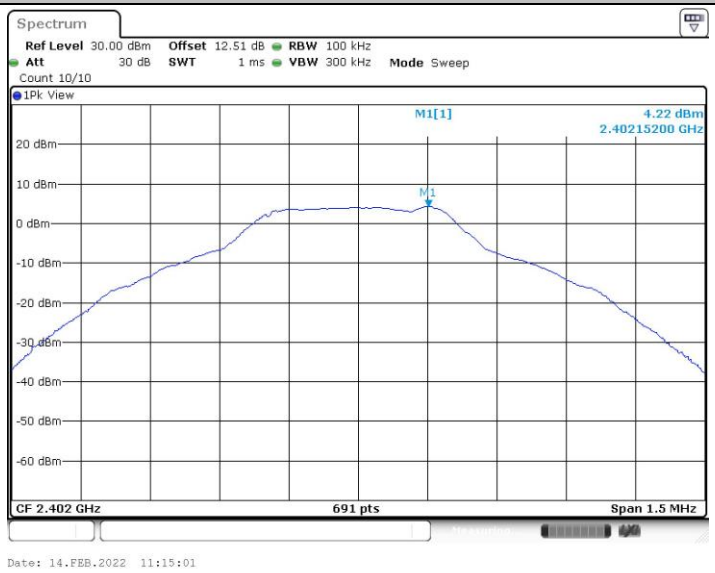
DH5_Ant1_2402_30~1000



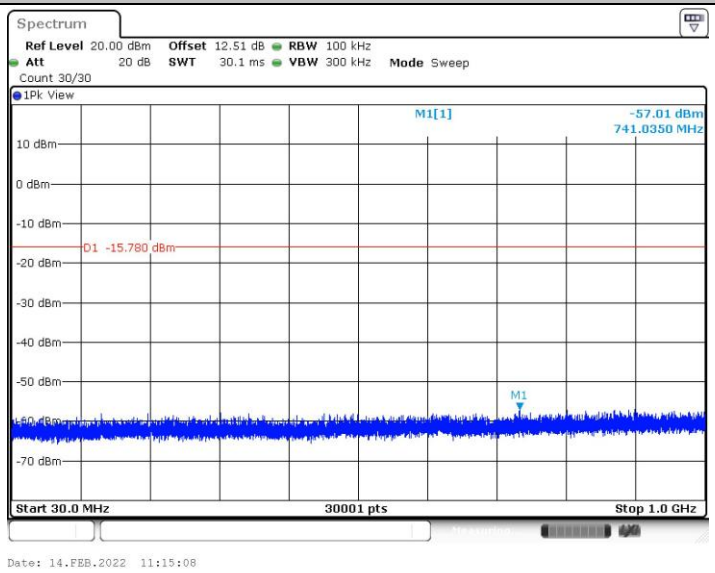
DH5_Ant1_2402_1000~26500



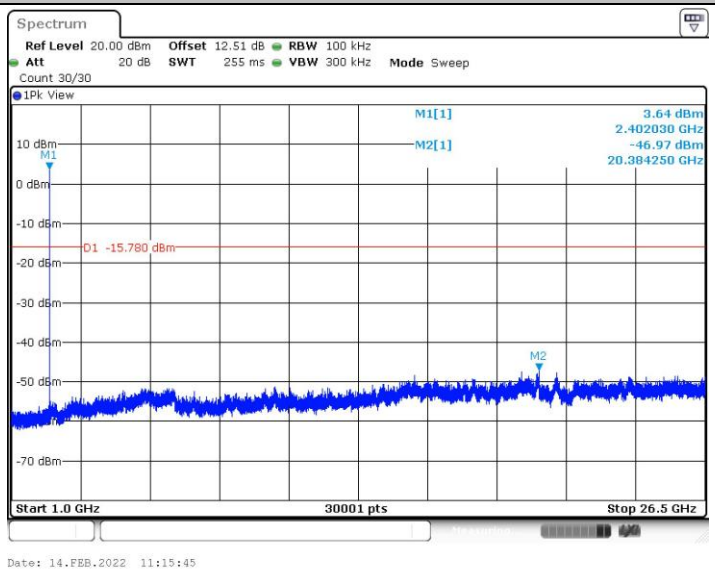
DH5_Ant2_2402_0~Reference



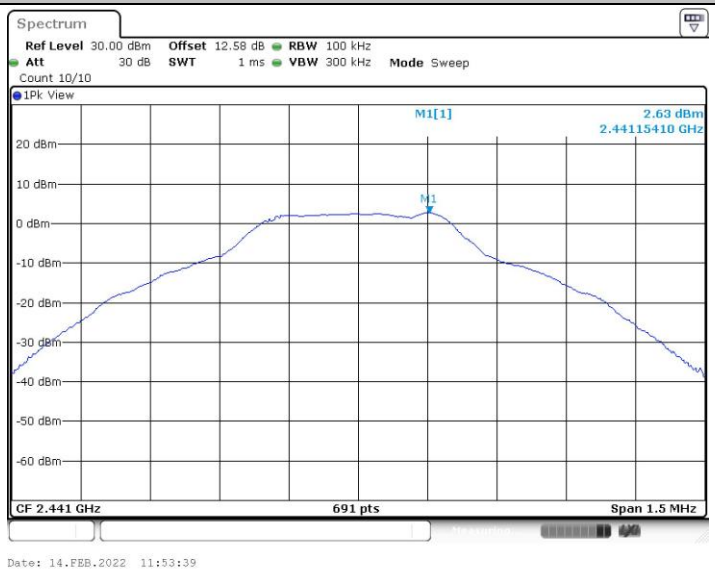
DH5_Ant2_2402_30~1000



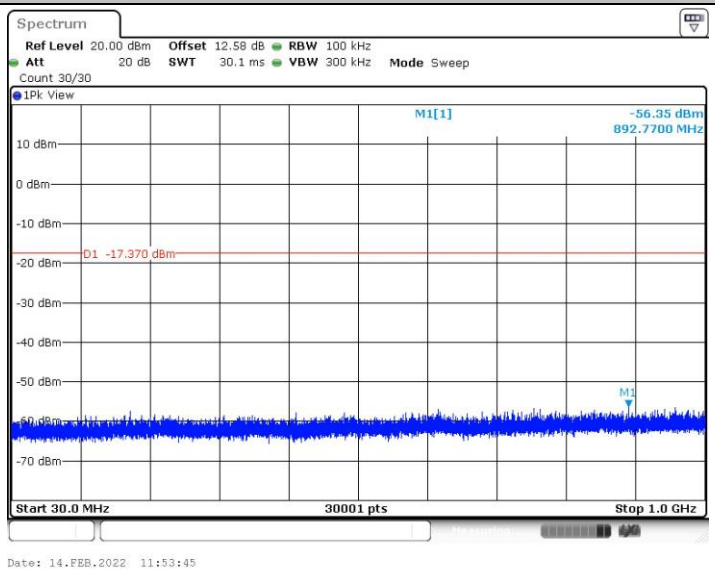
DH5_Ant2_2402_1000~26500



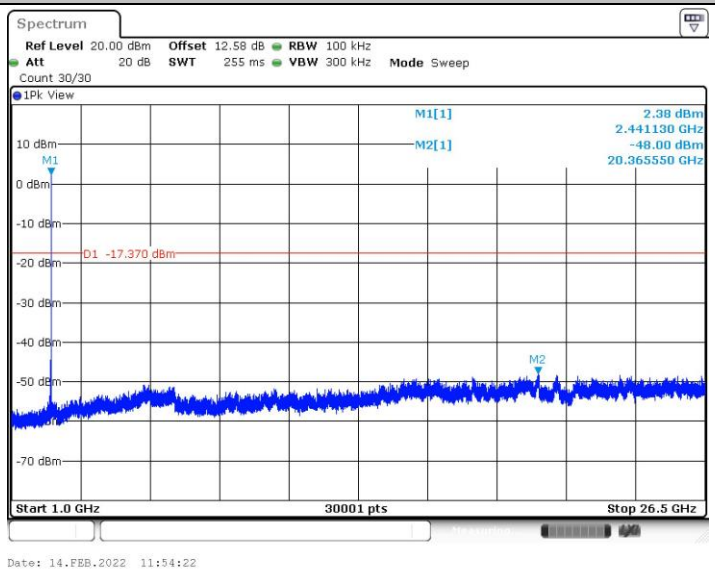
DH5_Ant1_2441_0~Reference



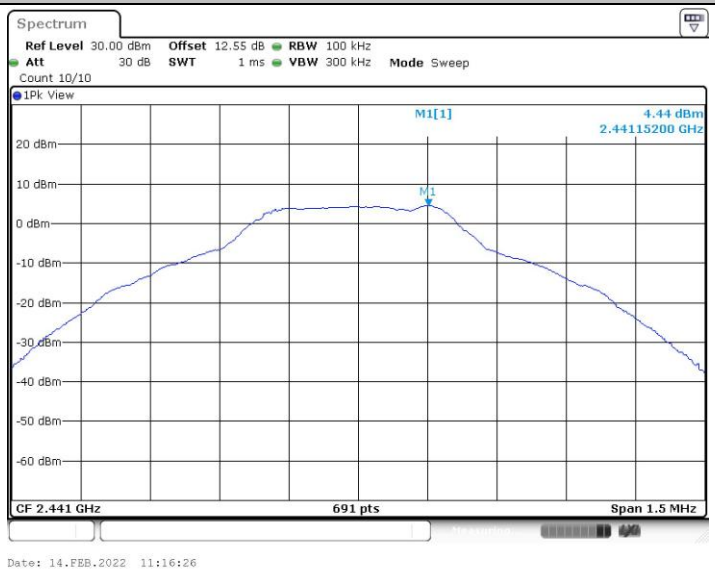
DH5_Ant1_2441_30~1000



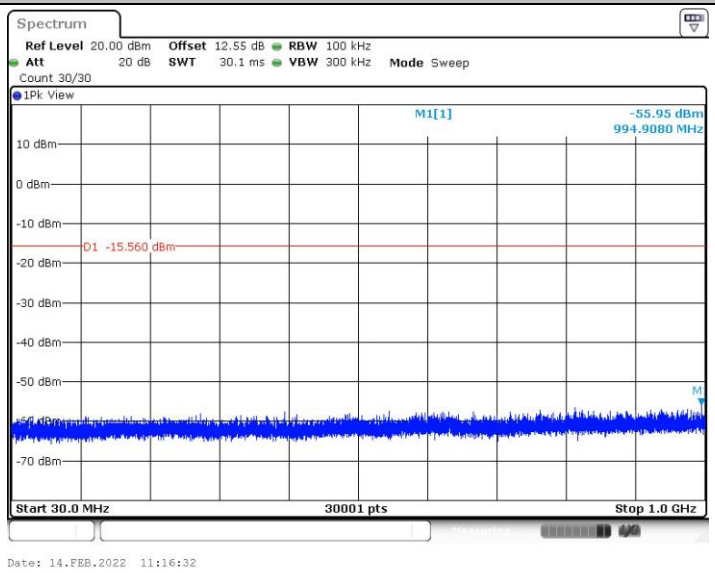
DH5_Ant1_2441_1000~26500



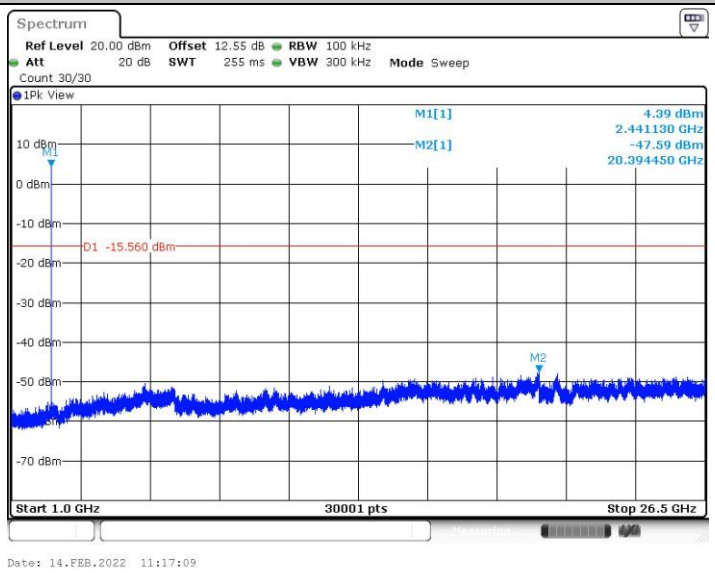
DH5_Ant2_2441_0~Reference



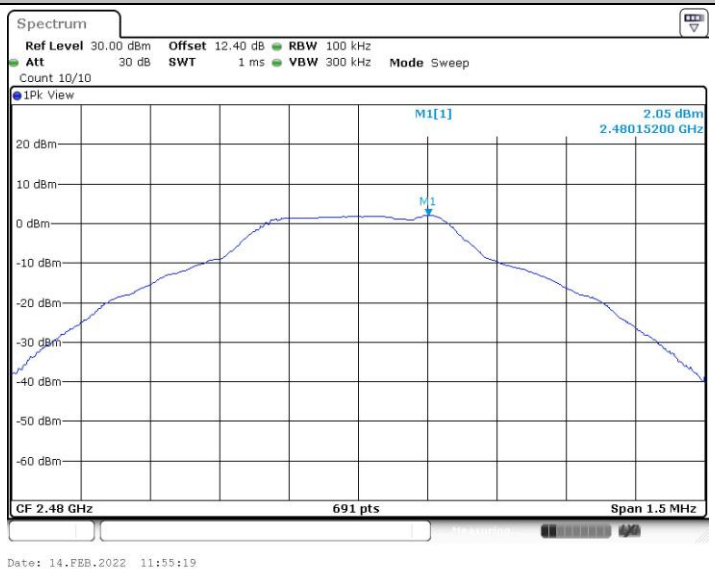
DH5_Ant2_2441_30~1000



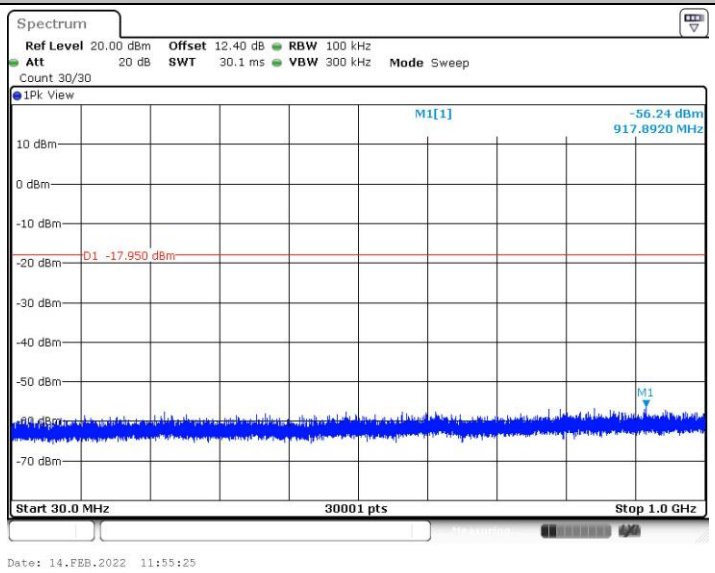
DH5_Ant2_2441_1000~26500



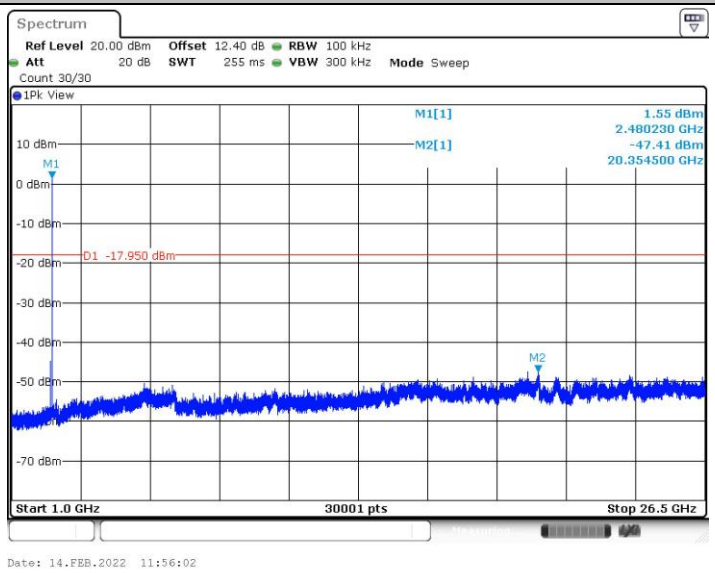
DH5_Ant1_2480_0~Reference



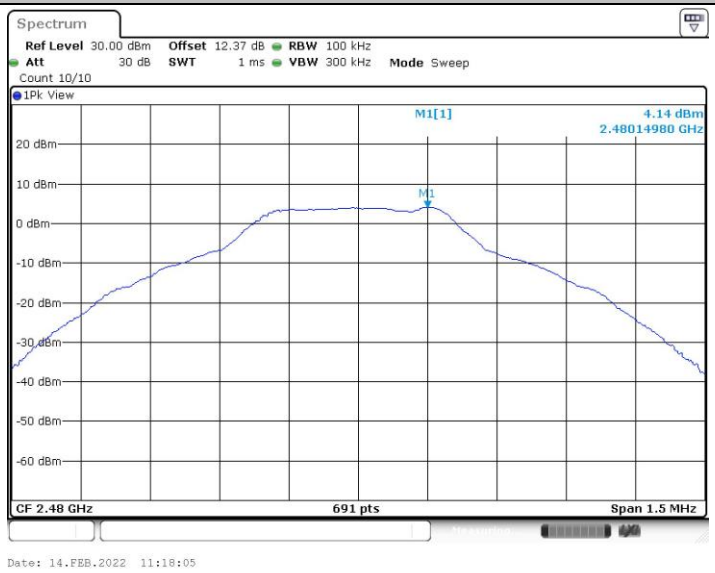
DH5_Ant1_2480_30~1000



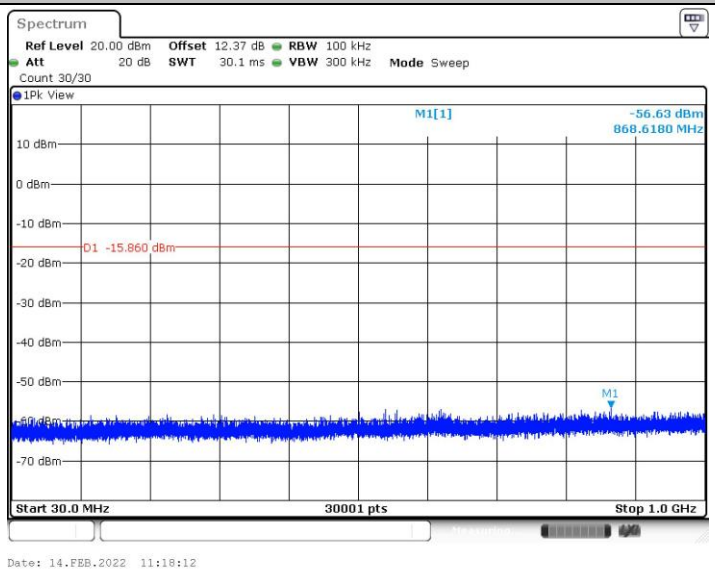
DH5_Ant1_2480_1000~26500



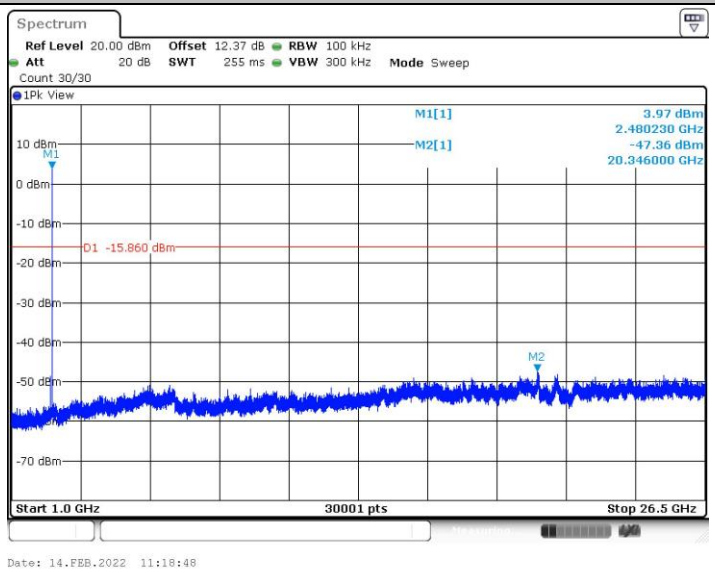
DH5_Ant2_2480_0~Reference



DH5_Ant2_2480_30~1000



DH5_Ant2_2480_1000~26500



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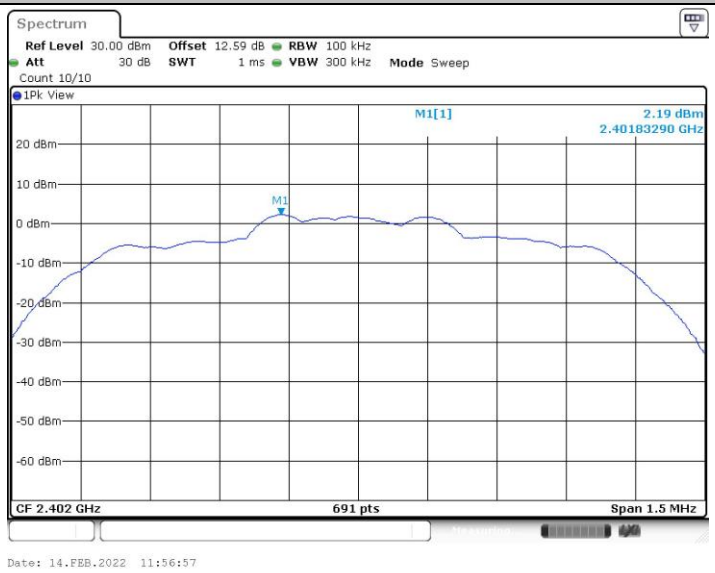
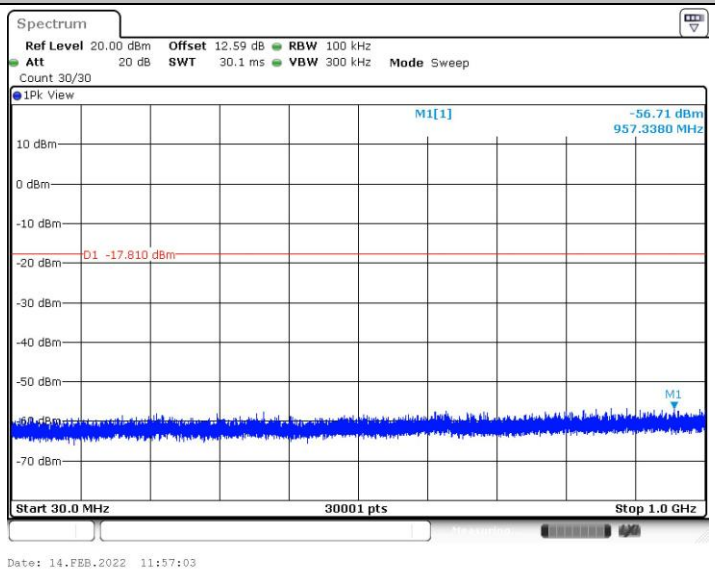
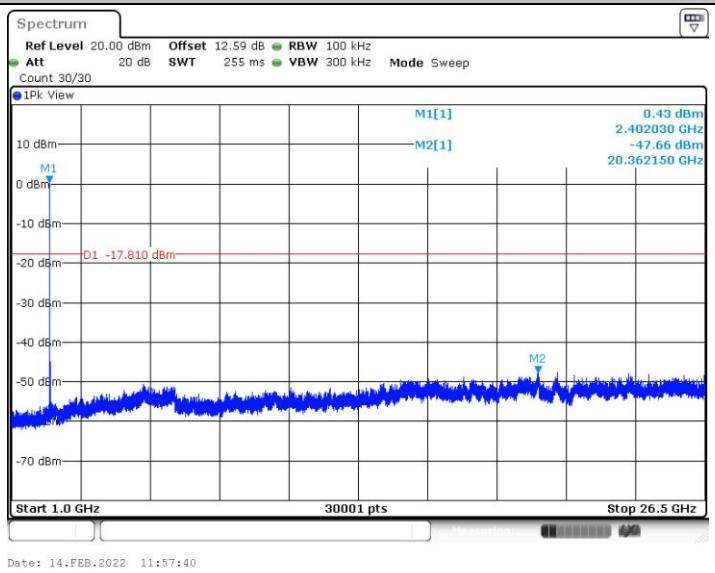


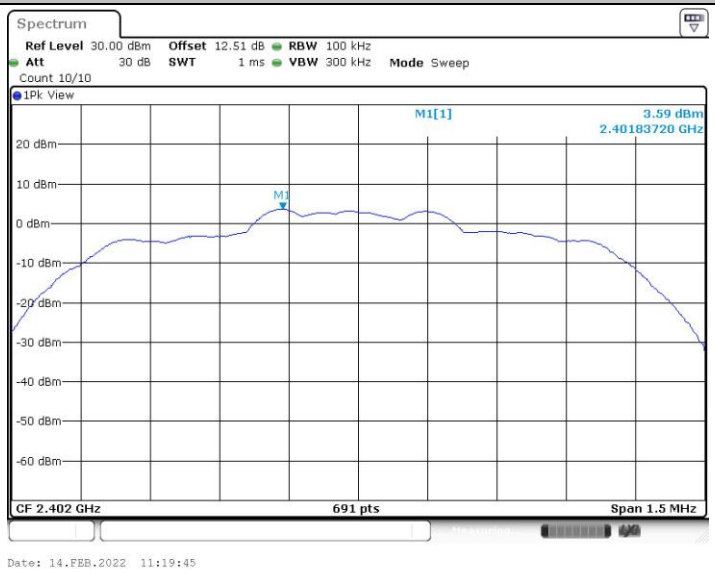
2DH1_Ant1_2402_30~1000



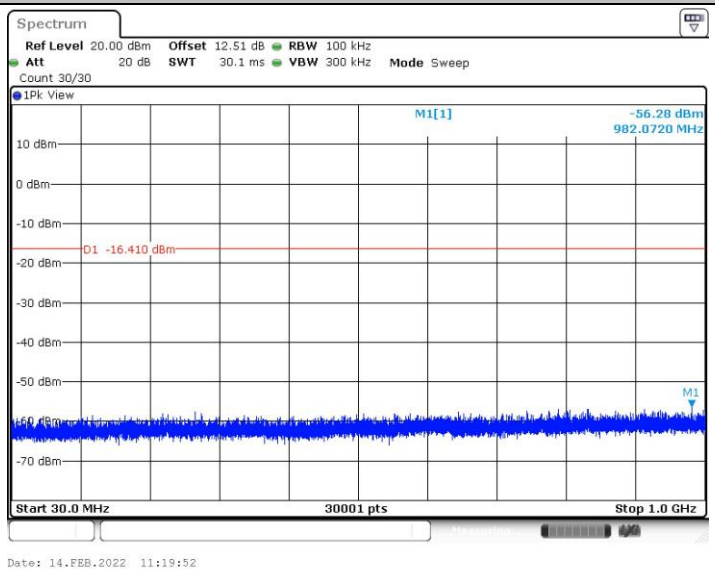
2DH1_Ant1_2402_1000~26500



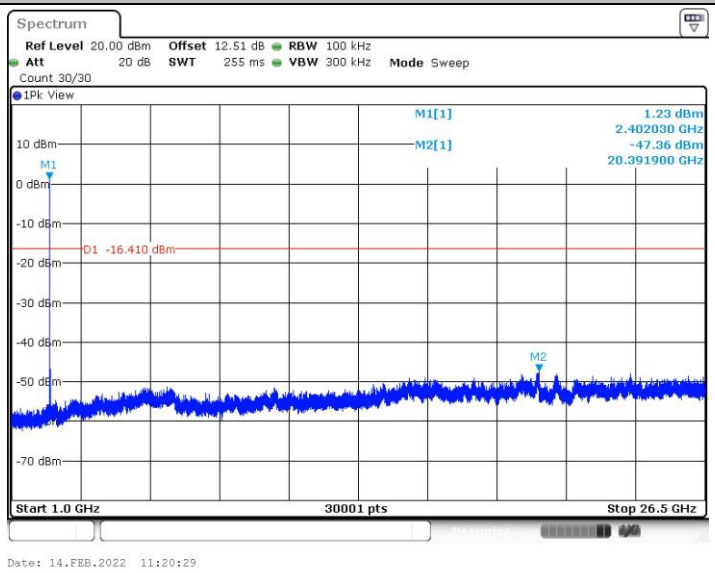
2DH1_Ant2_2402_0~Reference



2DH1_Ant2_2402_30~1000



2DH1_Ant2_2402_1000~26500



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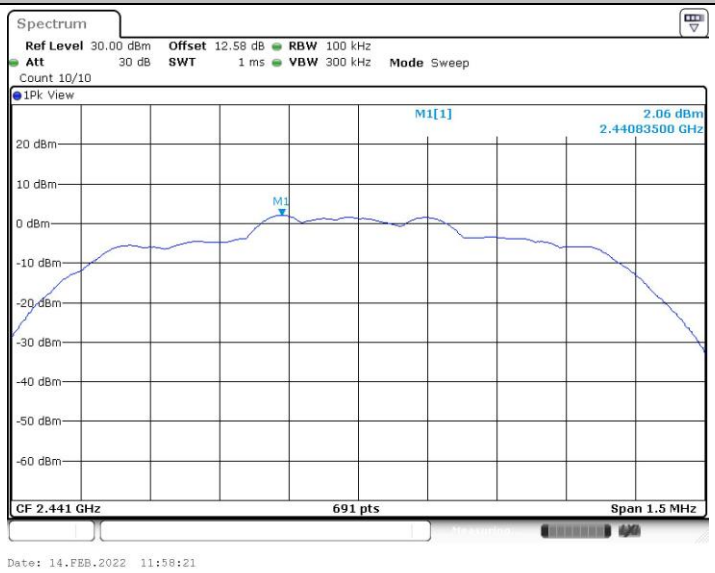
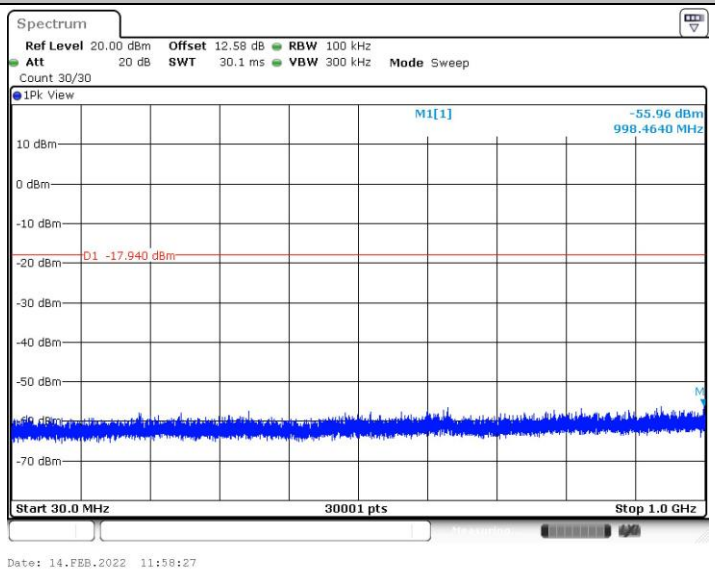
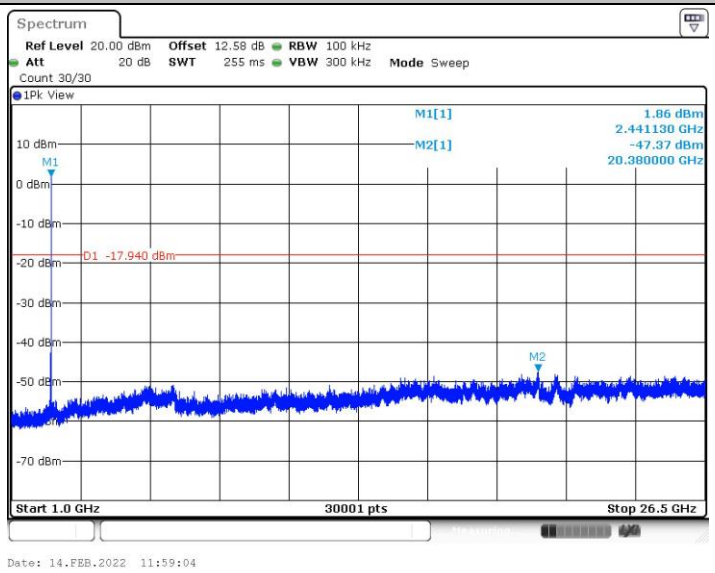


2DH1_Ant1_2441_30~1000

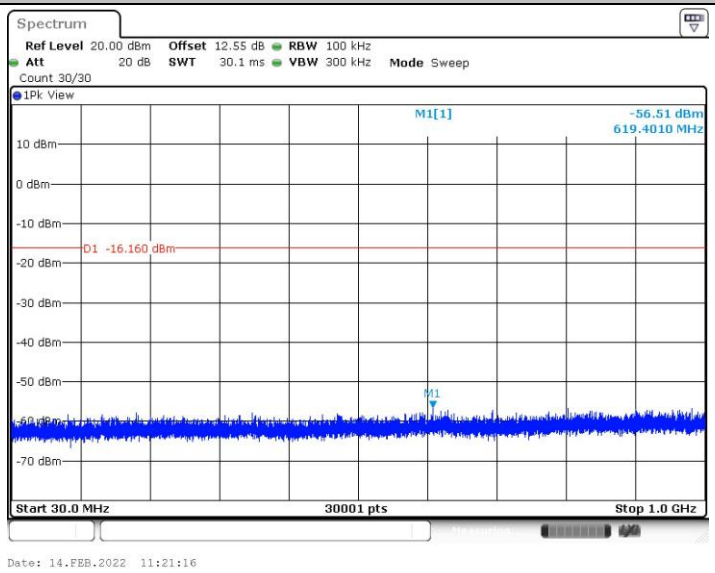


2DH1_Ant1_2441_1000~26500

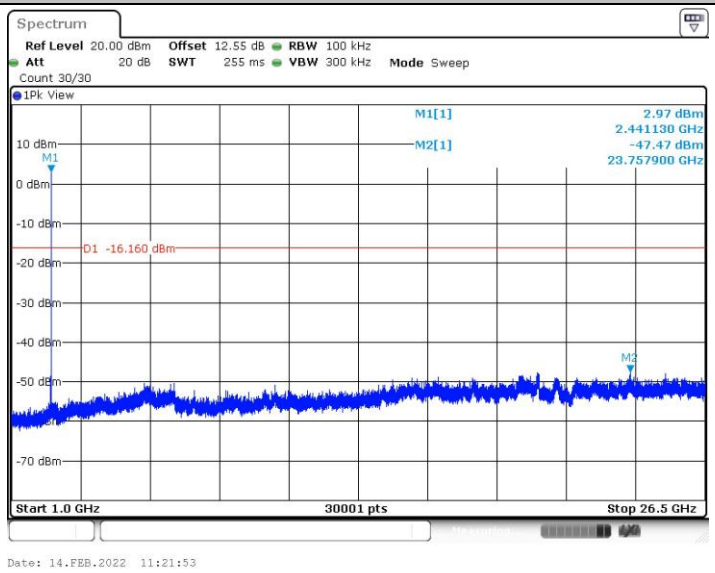


2DH1_Ant2_2441_0~Reference

2DH1_Ant2_2441_30~1000

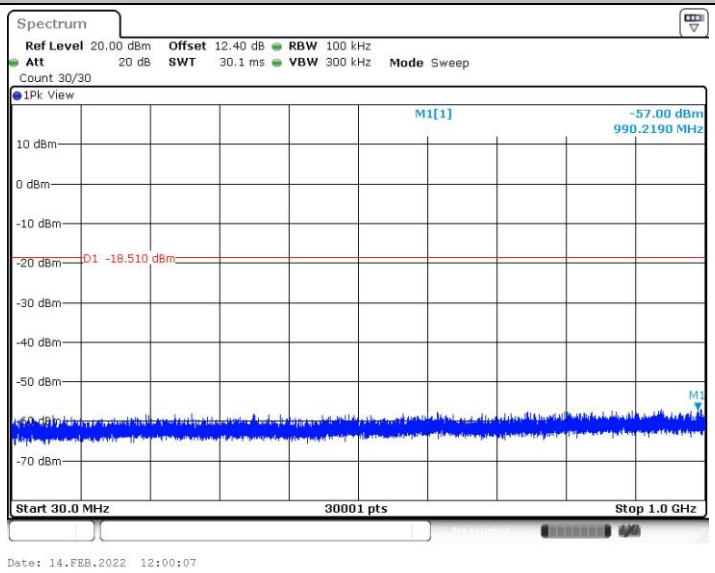


2DH1_Ant2_2441_1000~26500

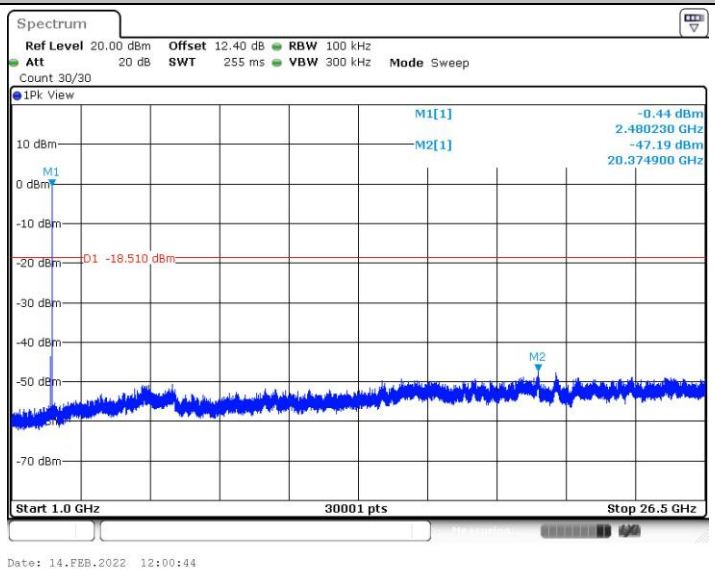


2DH1_Ant1_2480_0~Reference

2DH1_Ant1_2480_30~1000

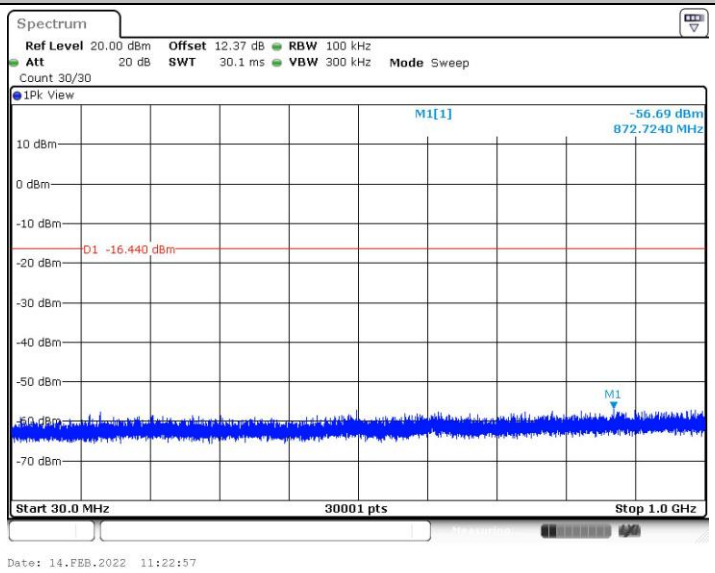


2DH1_Ant1_2480_1000~26500



2DH1_Ant2_2480_0~Reference

2DH1_Ant2_2480_30~1000



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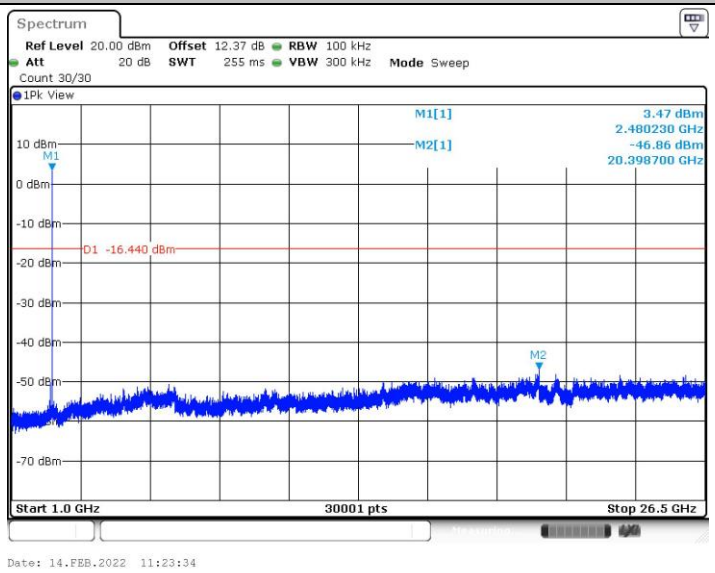
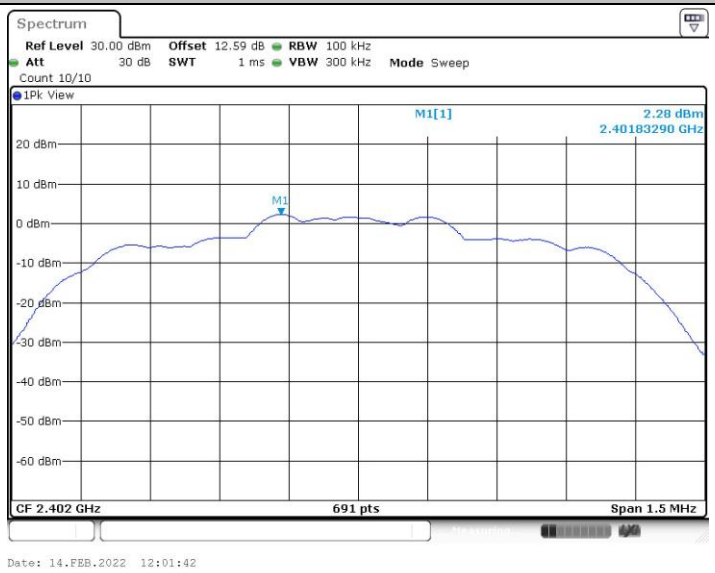
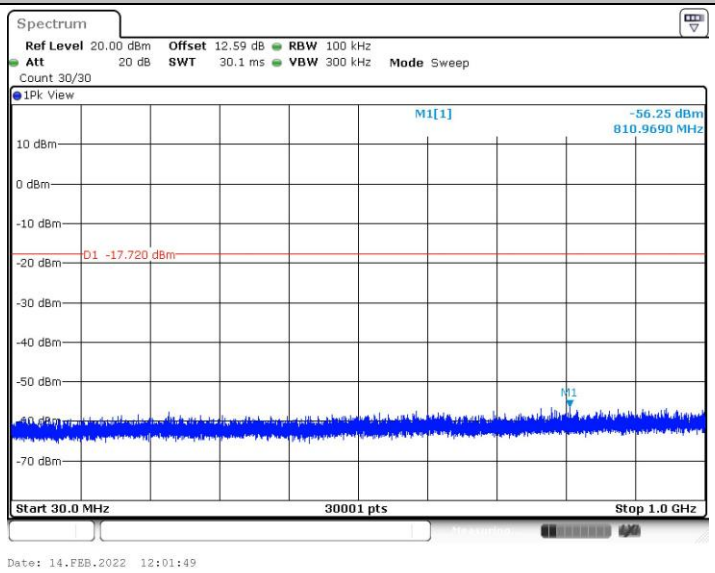


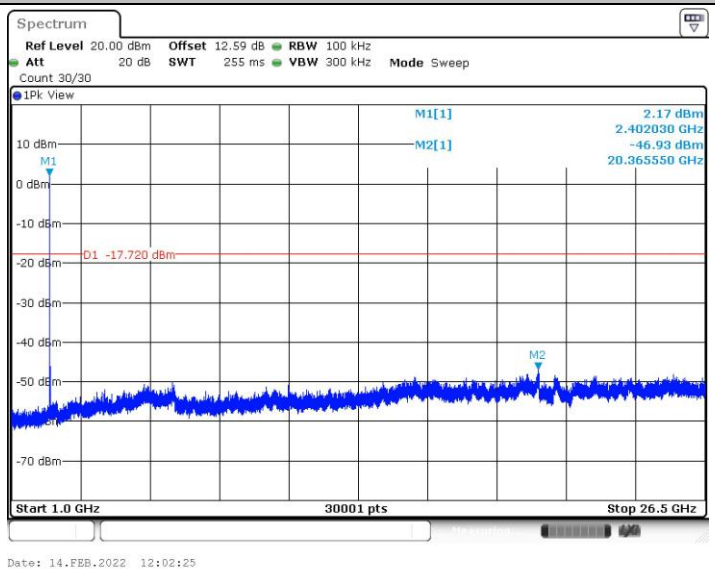
3DH1_Ant1_2402_0~Reference



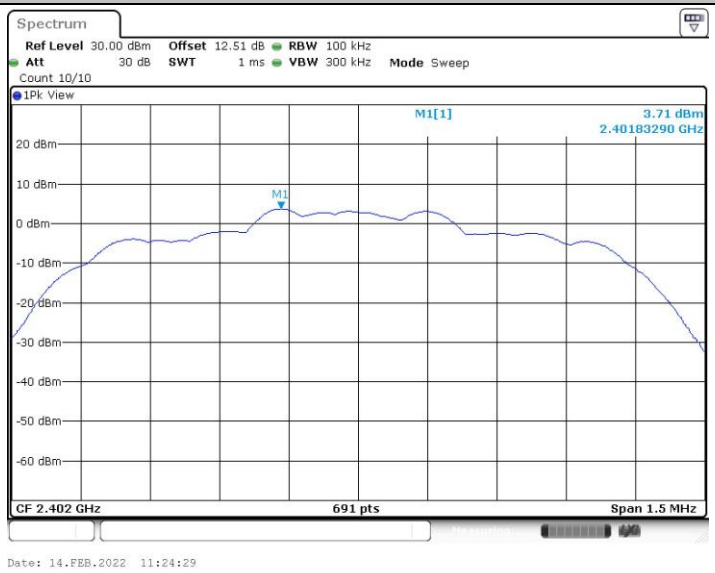
3DH1_Ant1_2402_30~1000



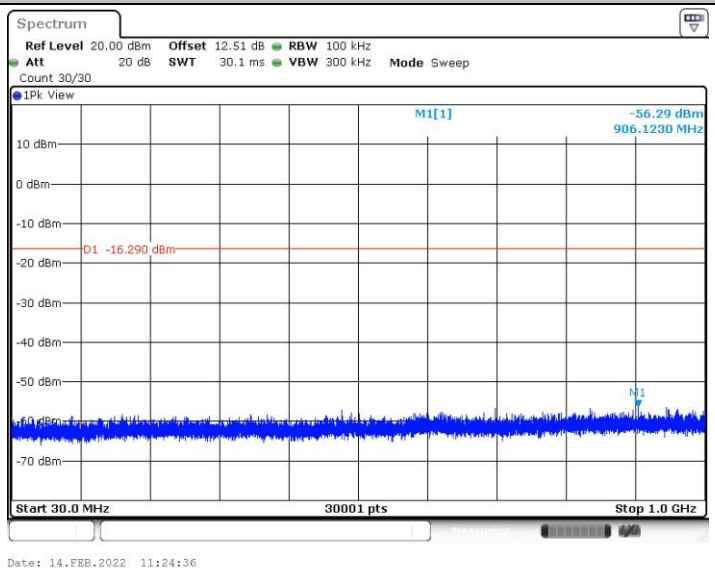
3DH1_Ant1_2402_1000~26500



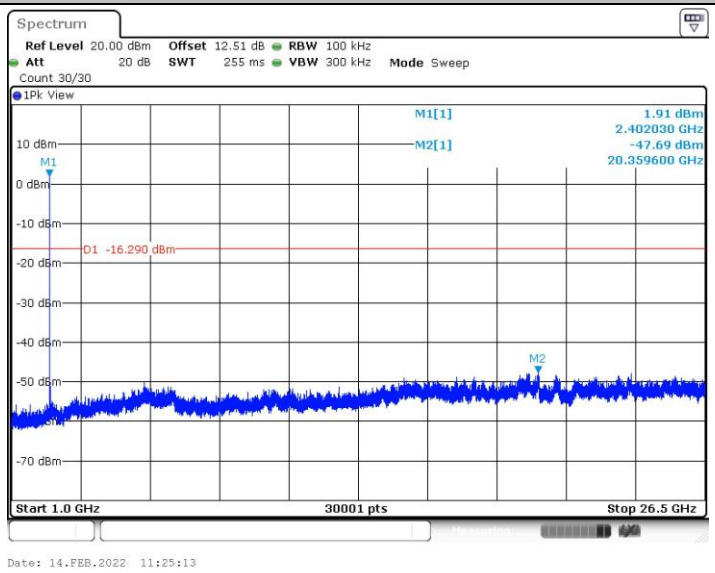
3DH1_Ant2_2402_0~Reference



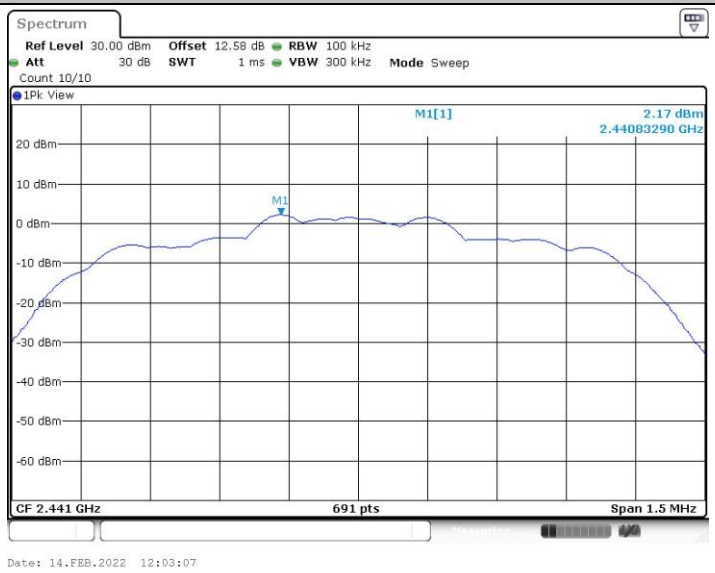
3DH1_Ant2_2402_30~1000



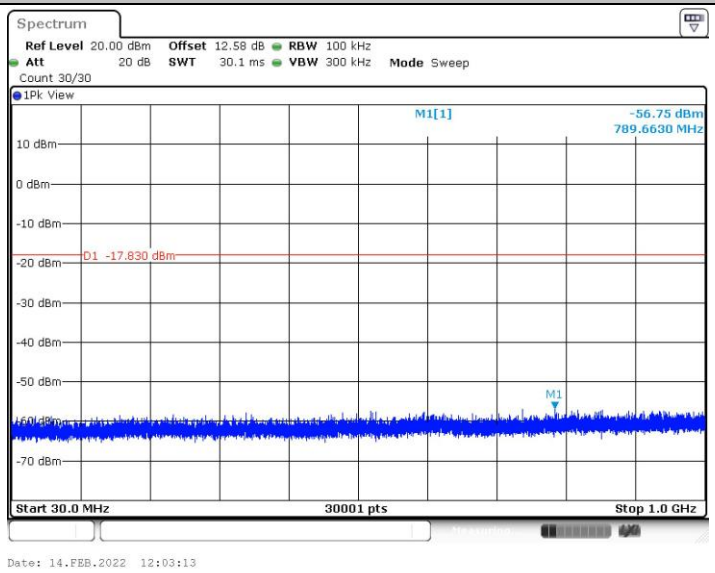
3DH1_Ant2_2402_1000~26500



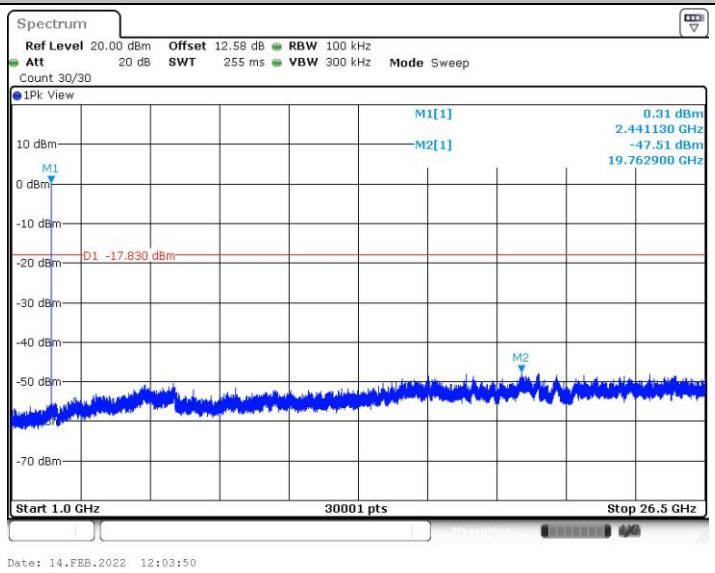
3DH1_Ant1_2441_0~Reference



3DH1_Ant1_2441_30~1000



3DH1_Ant1_2441_1000~26500



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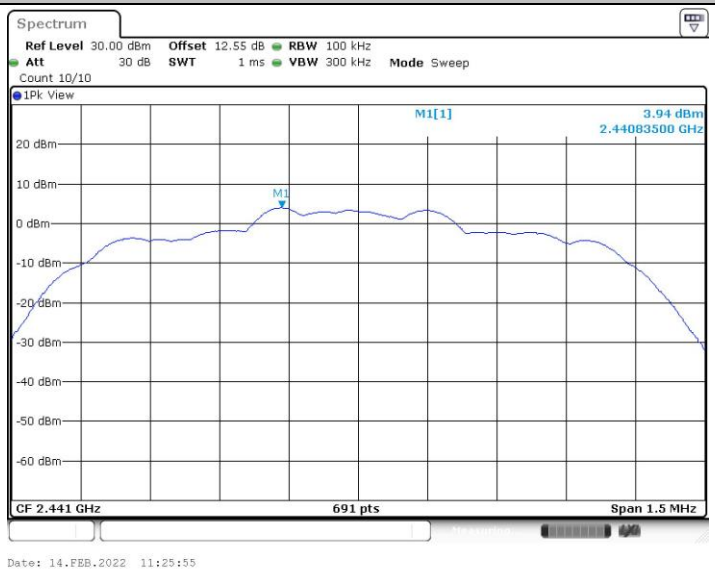

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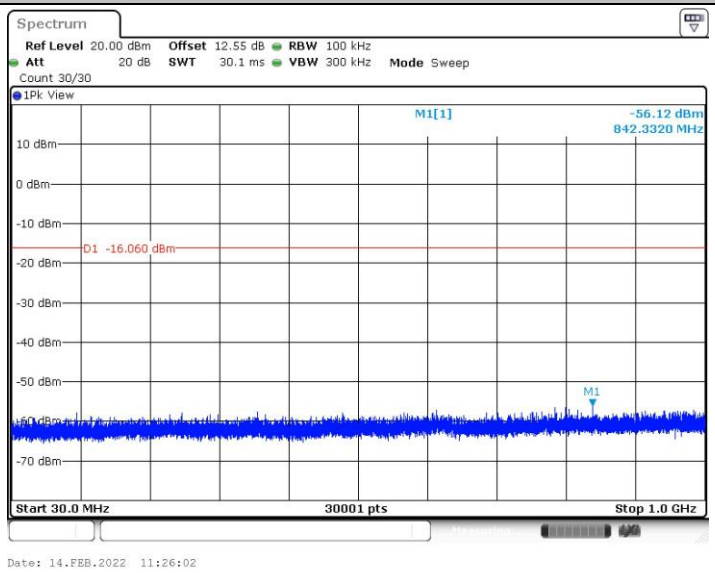
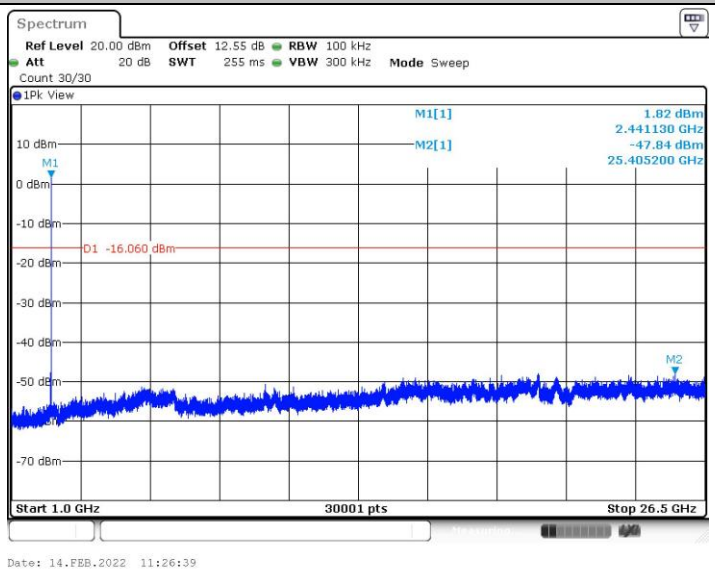
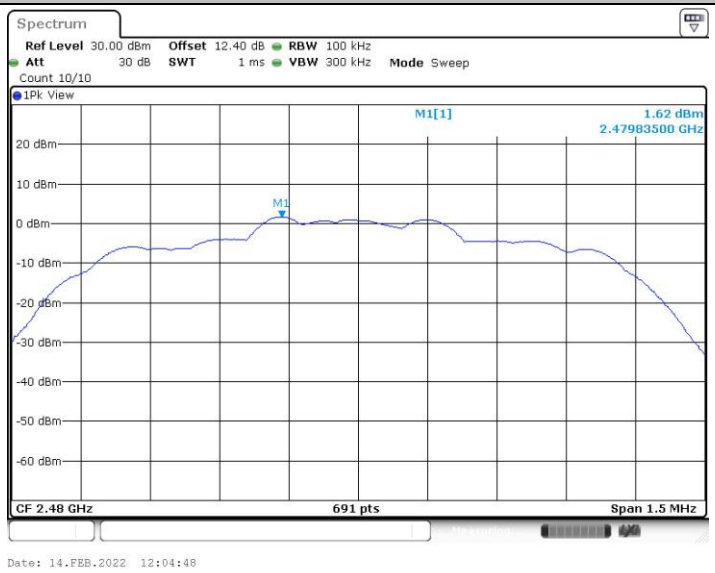


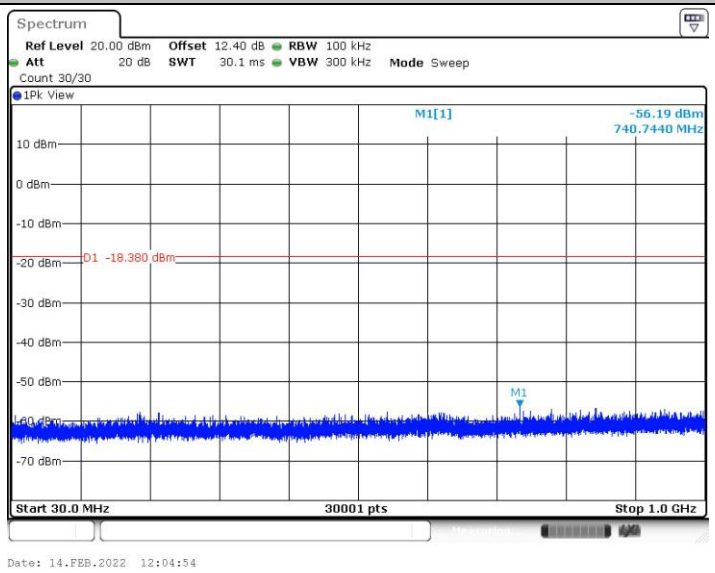
3DH1_Ant2_2441_1000~26500



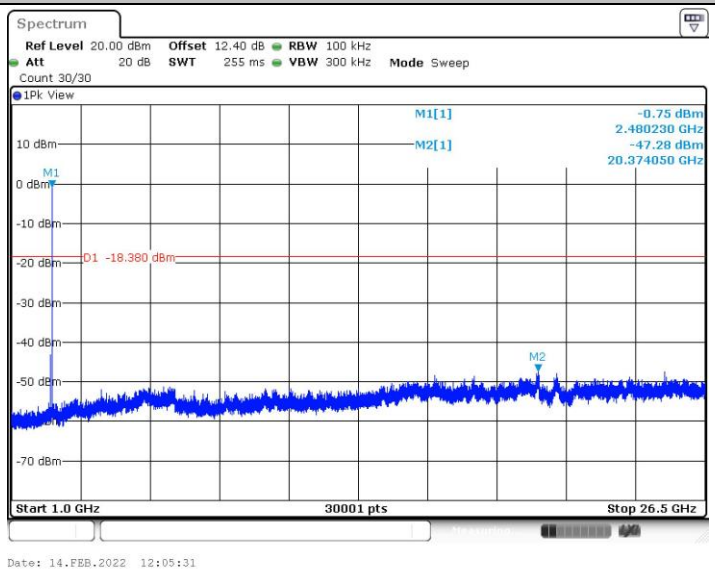
3DH1_Ant1_2480_0~Reference



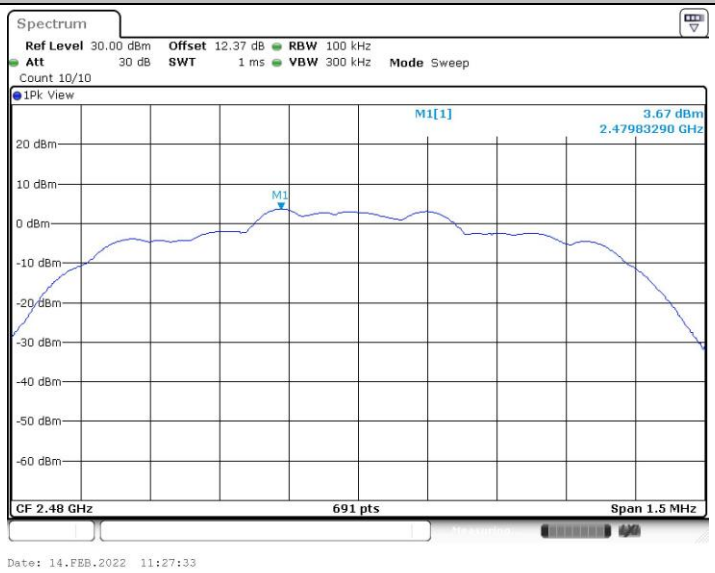
3DH1_Ant1_2480_30~1000



3DH1_Ant1_2480_1000~26500



3DH1_Ant2_2480_0~Reference



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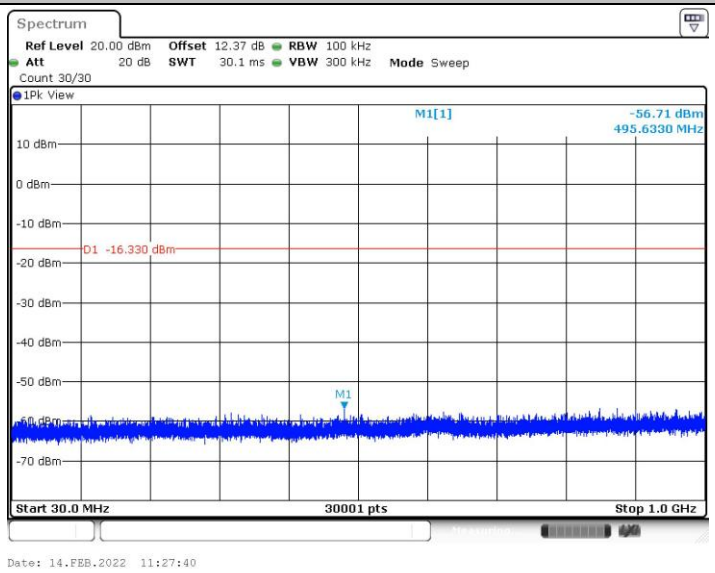
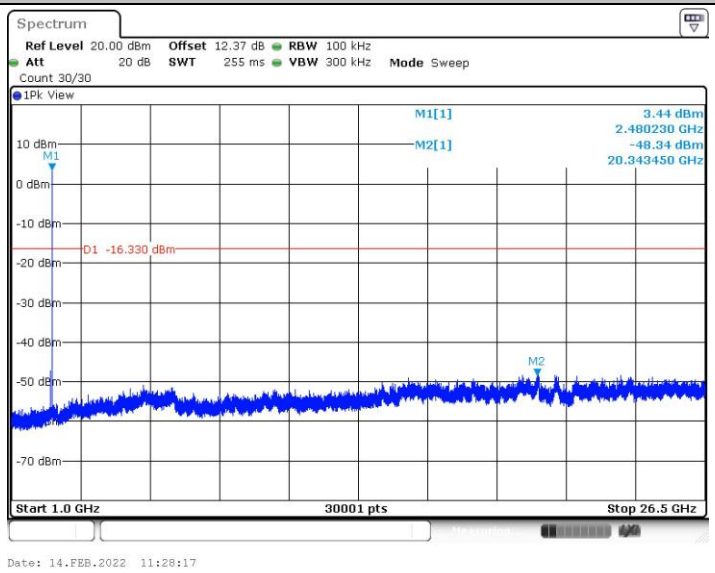


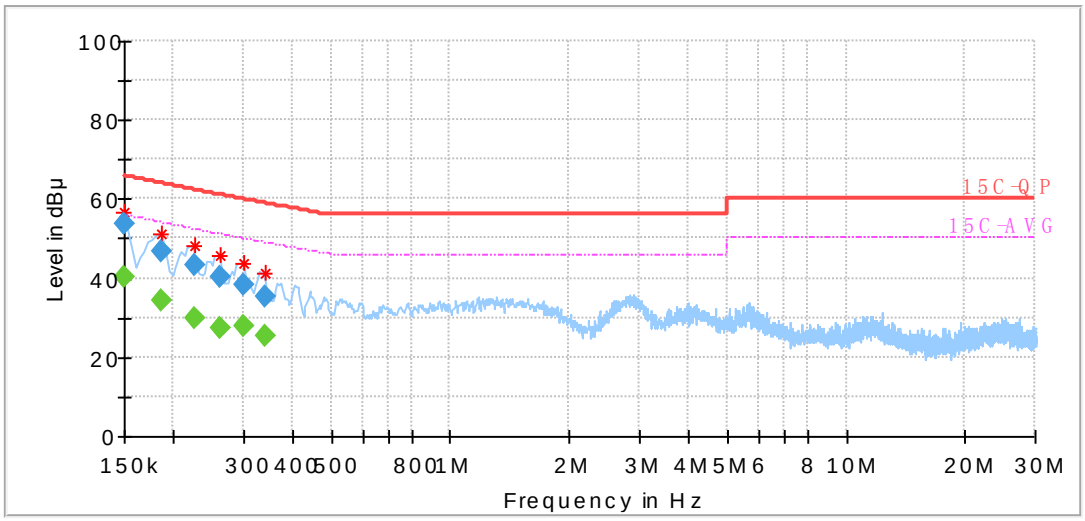
3DH1_Ant2_2480_1000~26500



Appendix B. AC Conducted Emission Test Results

Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

Full Spectrum

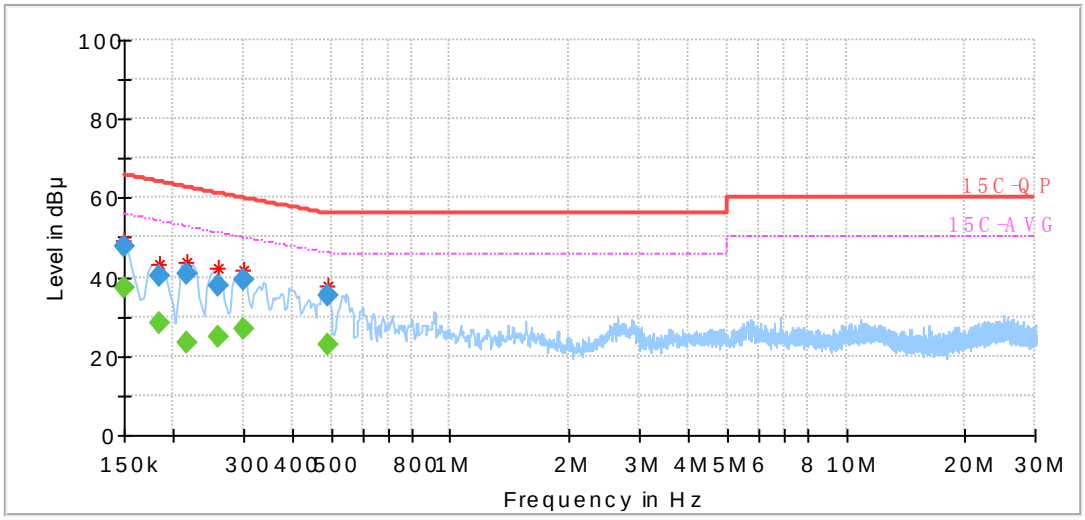


Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	40.40	56.00	15.60	L1	OFF	20.1
0.150000	53.71	---	66.00	12.29	L1	OFF	20.1
0.187312	---	34.20	54.00	19.80	L1	OFF	20.0
0.187312	46.73	---	64.03	17.30	L1	OFF	20.0
0.225394	---	29.91	52.40	22.49	L1	OFF	19.9
0.225394	43.08	---	62.43	19.35	L1	OFF	19.9
0.262706	---	27.60	51.10	23.51	L1	OFF	19.9
0.262706	40.05	---	61.14	21.09	L1	OFF	19.9
0.300788	---	28.06	49.98	21.92	L1	OFF	19.9
0.300788	38.35	---	60.02	21.67	L1	OFF	19.9
0.338812	---	25.18	49.02	23.84	L1	OFF	19.9
0.338812	35.18	---	59.05	23.87	L1	OFF	19.9

Test Engineer :	Amos Zhang	**Temperature :**	25.3~26.2℃
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	37.41	56.00	18.59	N	OFF	20.2
0.150000	48.01	---	66.00	17.99	N	OFF	20.2
0.184350	---	28.39	54.15	25.75	N	OFF	20.2
0.184350	40.11	---	64.17	24.06	N	OFF	20.2
0.215681	---	23.59	52.77	29.19	N	OFF	20.2
0.215681	40.75	---	62.81	22.06	N	OFF	20.2
0.258975	---	24.70	51.22	26.52	N	OFF	20.1
0.258975	37.76	---	61.26	23.50	N	OFF	20.1
0.301500	---	26.78	49.96	23.18	N	OFF	20.0
0.301500	39.52	---	60.00	20.48	N	OFF	20.0
0.489544	---	23.05	46.16	23.10	N	OFF	19.9
0.489544	35.22	---	56.16	20.94	N	OFF	19.9

Appendix C. Radiated Spurious Emission

Test Engineer :	Henzy Li	Temperature :	22~23°C
		Relative Humidity :	41~42%

2.4GHz 2400~2483.5MHz

BT---ANT 1 (Band Edge @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH00 2402MHz		2389.3	53.53	-20.47	74	48.31	30.94	7.16	32.88	125	295	P	H
	*	2389.3	28.74	-25.26	54	-	-	-	-	-	-	A	H
		2402	99.20	-	-	93.88	31	7.16	32.84	125	295	P	H
		2402	74.41	-	-	-	-	-	-	-	-	A	H
		2386.57	54.02	-18.98	74	48.8	30.94	7.16	32.88	339	250	P	V
	*	2386.57	30.23	-23.77	54	-	-	-	-	-	-	A	V
		2402	101.04	-	-	95.72	31	7.16	32.84	339	250	P	V
		2402	76.25	-	-	-	-	-	-	-	-	A	V
BT CH 39 2441MHz		2380.2	53.21	-20.79	74	48.08	30.88	7.13	32.88	289	320	P	H
	*	2380.2	28.42	-25.58	54	-	-	-	-	-	-	A	H
		2442	99.44	-	-	93.85	31.07	7.23	32.71	289	320	P	H
		2442	74.65	-	-	-	-	-	-	-	-	A	H
		2497.9	54.59	-19.41	74	48.69	31.17	7.3	32.57	289	320	P	H
		2497.9	29.80	-24.20	54	-	-	-	-	-	-	A	H
		2387.87	53.64	-20.36	74	48.42	30.94	7.16	32.88	336	225	P	V
	*	2387.87	28.85	-25.15	54	-	-	-	-	-	-	A	V
		2442	99.28	-	-	93.69	31.07	7.23	32.71	336	225	P	V
		2442	74.49	-	-	-	-	-	-	-	-	A	V
		2492.02	54.15	-19.85	74	48.25	31.17	7.3	32.57	336	225	P	V
		2492.02	29.36	-24.64	54	-	-	-	-	-	-	A	V

BT CH 78 2480MHz	*	2480	99.20	-	-	93.44	31.13	7.27	32.64	320	299	P	H
		2480	74.41	-	-	-	-	-	-	-	-	A	H
		2490.94	53.72	-20.28	74	47.89	31.17	7.30	32.64	320	299	P	H
		2490.94	28.93	-25.07	54	-	-	-	-	-	-	A	H
	*	2480	100.51	-	-	94.75	31.13	7.27	32.64	358	227	P	V
		2480	75.72	-	-	-	-	-	-	-	-	A	V
		2489.14	54.31	-19.69	74	48.48	31.17	7.30	32.64	358	227	P	V
		2489.14	29.52	-24.48	54	-	-	-	-	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BT---ANT 1 (Harmonic @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 00 2402MHz		4800	42.71	-31.29	74	58	34.51	10.24	60.04	300	0	P	H
		4800	40.68	-33.32	74	55.97	34.51	10.24	60.04	100	0	P	V
BT CH 39 2441MHz		4875	41.89	-32.11	74	56.94	34.66	10.32	60.03	300	0	P	H
		7320	44.51	-29.49	74	55.7	36.56	12.77	60.52	300	0	P	H
		4875	41.03	-32.97	74	56.08	34.66	10.32	60.03	100	0	P	V
		7320	43.77	-30.23	74	54.96	36.56	12.77	60.52	100	0	P	V
BT CH 78 2480MHz		4965	43.5	-30.5	74	58.27	34.81	10.43	60.01	300	0	P	H
		7440	45.02	-28.98	74	56.09	36.59	12.88	60.54	300	0	P	H
		4965	41.94	-32.06	74	56.71	34.81	10.43	60.01	100	0	P	V
		7440	44.62	-29.38	74	55.69	36.59	12.88	60.54	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

BT---ANT 2 (Band Edge @ 3m)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH00 2402MHz		2364.86	53.32	-20.68	74	48.27	30.83	7.1	32.88	104	118	P	H
	*	2364.86	28.53	-25.47	54	-	-	-	-	-	-	A	H
		2402	101.96	-	-	96.64	31	7.16	32.84	104	118	P	H
		2402	77.17	-	-	-	-	-	-	-	-	A	H
		2333.4	53.38	-20.62	74	48.53	30.77	7.04	32.96	391	54	P	V
	*	2333.4	28.59	-25.41	54	-	-	-	-	-	-	A	V
		2402	100.14	-	-	94.82	31	7.16	32.84	391	54	P	V
		2402	75.35	-	-	-	-	-	-	-	-	A	V
BT CH 39 2441MHz		2387.87	53.73	-20.27	74	48.51	30.94	7.16	32.88	104	118	P	H
	*	2387.87	28.94	-25.06	54	-	-	-	-	-	-	A	H
		2442	102.88	-	-	97.29	31.07	7.23	32.71	104	118	P	H
		2442	78.09	-	-	-	-	-	-	-	-	A	H
		2488.78	53.77	-20.23	74	47.94	31.17	7.3	32.64	104	118	P	H
		2488.78	28.98	-25.02	54	-	-	-	-	-	-	A	H
		2367.33	53.44	-20.56	74	48.34	30.88	7.1	32.88	383	30	P	V
	*	2367.33	28.65	-25.35	54	-	-	-	-	-	-	A	V
		2442	99.59	-	-	94	31.07	7.23	32.71	383	30	P	V
		2442	74.80	-	-	-	-	-	-	-	-	A	V
		2499.82	53.69	-20.31	74	47.79	31.17	7.3	32.57	383	30	P	V
		2499.82	28.90	-25.10	54	-	-	-	-	-	-	A	V
BT CH 78 2480MHz	*	2480	101.51	-	-	95.75	31.13	7.27	32.64	124	132	P	H
		2480	76.72	-	-	-	-	-	-	-	-	A	H
		2491.42	54.02	-19.98	74	48.19	31.17	7.3	32.64	124	132	P	H
		2491.42	29.23	-24.77	54	-	-	-	-	-	-	A	H
	*	2480	100.59	-	-	94.83	31.13	7.27	32.64	400	44	P	V
		2480	75.80	-	-	-	-	-	-	-	-	A	V
		2491.48	54.03	-19.97	74	48.2	31.17	7.3	32.64	400	44	P	V
		2491.48	29.24	-24.76	54	-	-	-	-	-	-	A	V

Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.

2.4GHz 2400~2483.5MHz

BT---ANT 2 (Harmonic @ 3m)

BT	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
BT CH 00 2402MHz		4800	41.77	-32.23	74	57.06	34.51	10.24	60.04	300	0	P	H
		4800	40.52	-33.48	74	55.81	34.51	10.24	60.04	100	0	P	V
BT CH 39 2441MHz		4875	42.3	-31.7	74	57.35	34.66	10.32	60.03	300	0	P	H
		7320	43.81	-30.19	74	55	36.56	12.77	60.52	300	0	P	H
		4875	41.18	-32.82	74	56.23	34.66	10.32	60.03	100	0	P	V
		7320	44.18	-29.82	74	55.37	36.56	12.77	60.52	100	0	P	V
BT CH 78 2480MHz		4965	42.5	-31.5	74	57.27	34.81	10.43	60.01	300	0	P	H
		7440	44.4	-29.6	74	55.47	36.59	12.88	60.54	300	0	P	H
		4965	41.47	-32.53	74	56.24	34.81	10.43	60.01	100	0	P	V
		7440	44.47	-29.53	74	55.54	36.59	12.88	60.54	100	0	P	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz BT (LF)

BT	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz BT LF		108.57	21.93	-21.57	43.5	34.74	17.26	1.7	31.77	-	-	P	H
		194.9	33.28	-10.22	43.5	46.79	15.56	2.27	31.34	-	-	P	H
		248.25	23.11	-22.89	46	33.47	18.46	2.54	31.36	-	-	P	H
		482.02	24.42	-21.58	46	28.74	23.41	3.57	31.3	-	-	P	H
		576.11	26.28	-19.72	46	28.68	25.14	3.91	31.45	-	-	P	H
		773.02	28.89	-17.11	46	29.67	25.87	4.52	31.17	-	-	P	H
		57.16	31.28	-8.72	40	47.84	13.88	0.98	31.42	-	-	P	V
		94.02	33.14	-10.36	43.5	46.69	16.84	1.54	31.93	-	-	P	V
		141.55	33.02	-10.48	43.5	44.91	17.6	1.92	31.41	-	-	P	V
		182.29	28.98	-14.52	43.5	41.41	16.72	2.18	31.33	-	-	P	V
		400.54	24.25	-21.75	46	29.5	22.72	3.26	31.23	-	-	P	V
		672.14	28.81	-17.19	46	30.02	25.81	4.22	31.24	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

BT	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
BT CH 00 2402MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

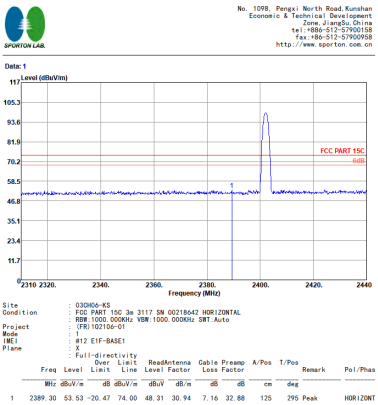
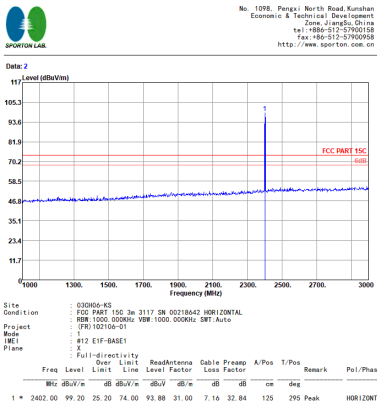
= -10.46(dB)

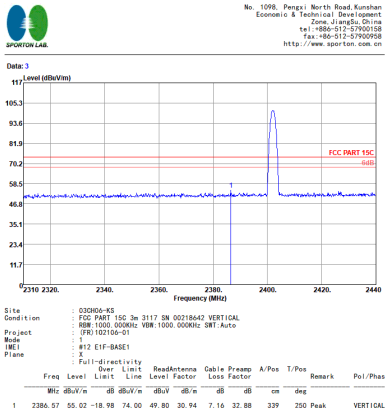
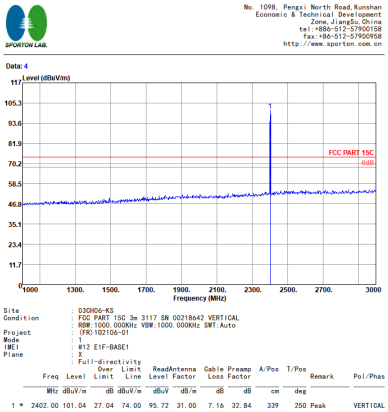
Both peak and average measured complies with the limit line, so test result is "PASS".

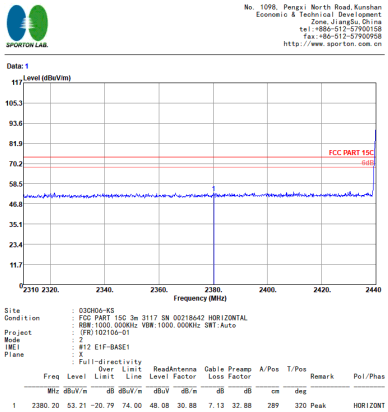
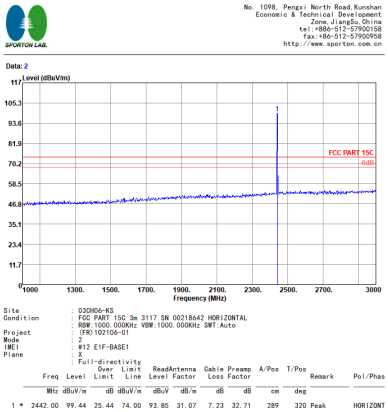
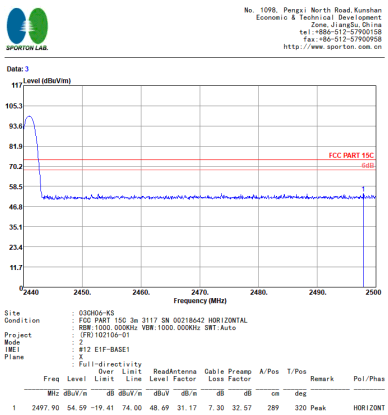
Appendix D. Radiated Spurious Emission Plots

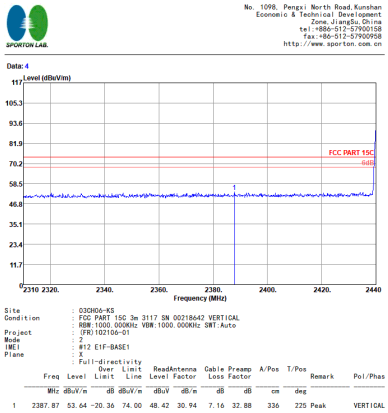
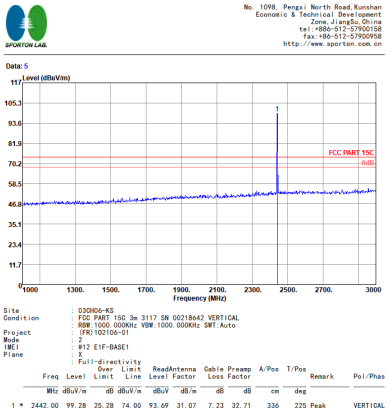
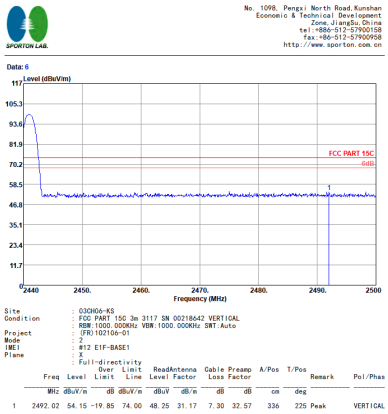
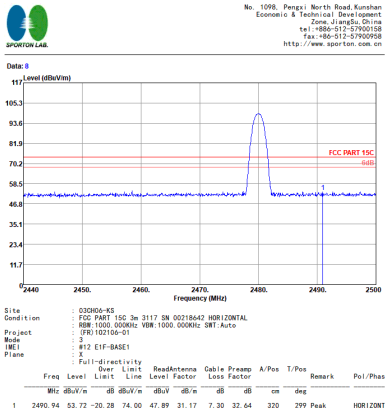
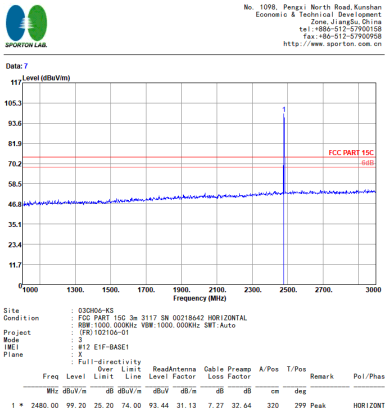
2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
1	Horizontal	Fundamental
Peak		

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH00 2402MHz	
1	Vertical	Fundamental
Peak		

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH39 2441MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

BT	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	BT CH78 2480MHz	
1	Horizontal	Fundamental
Peak