

Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Sunrise Alarm Clock Speaker

Test Model: X-01

Environmental Conditions

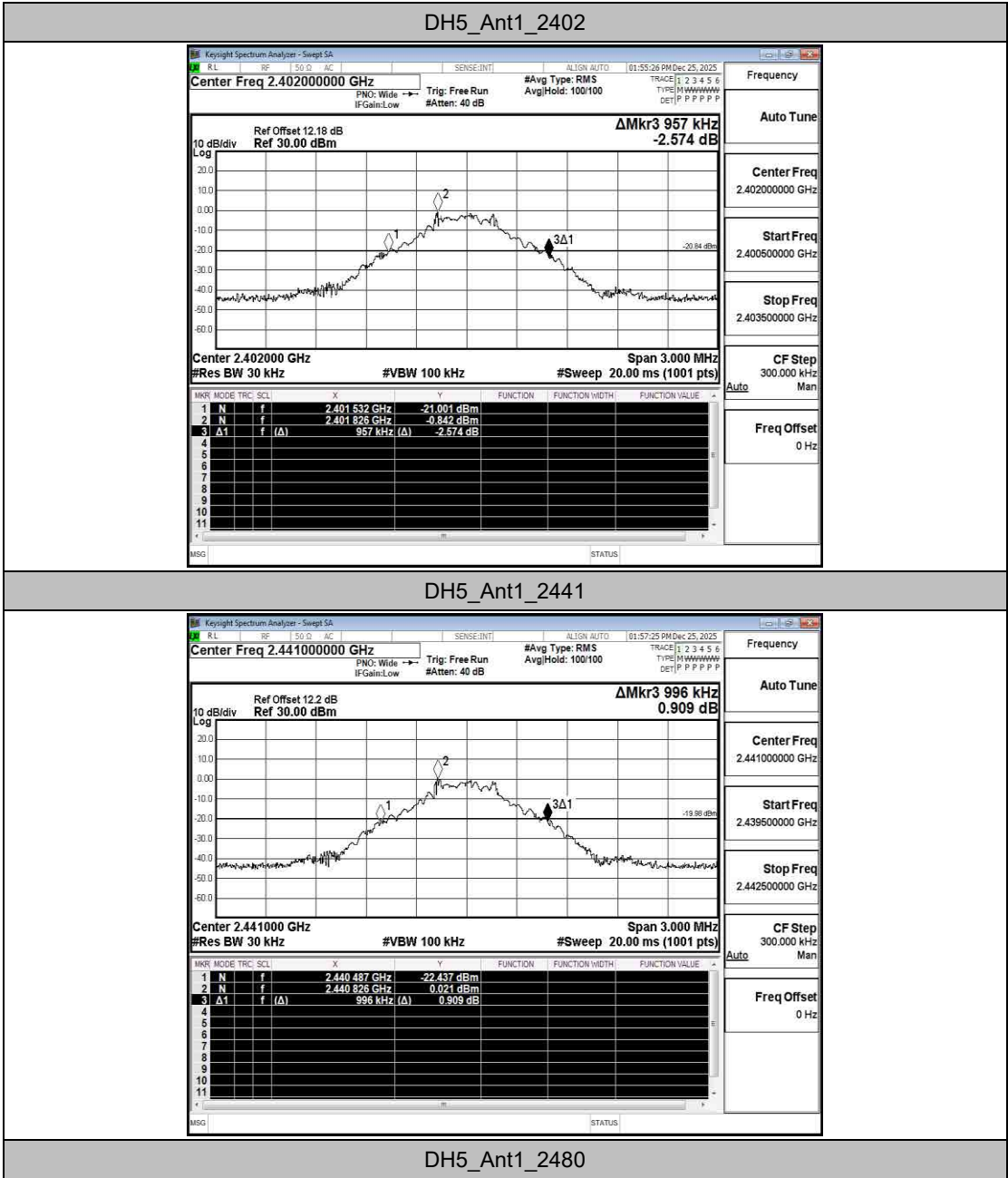
Temperature:	24.3°C
Relative Humidity:	53.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Yongzhou Huang
Supervised by:	Fengliu Tang

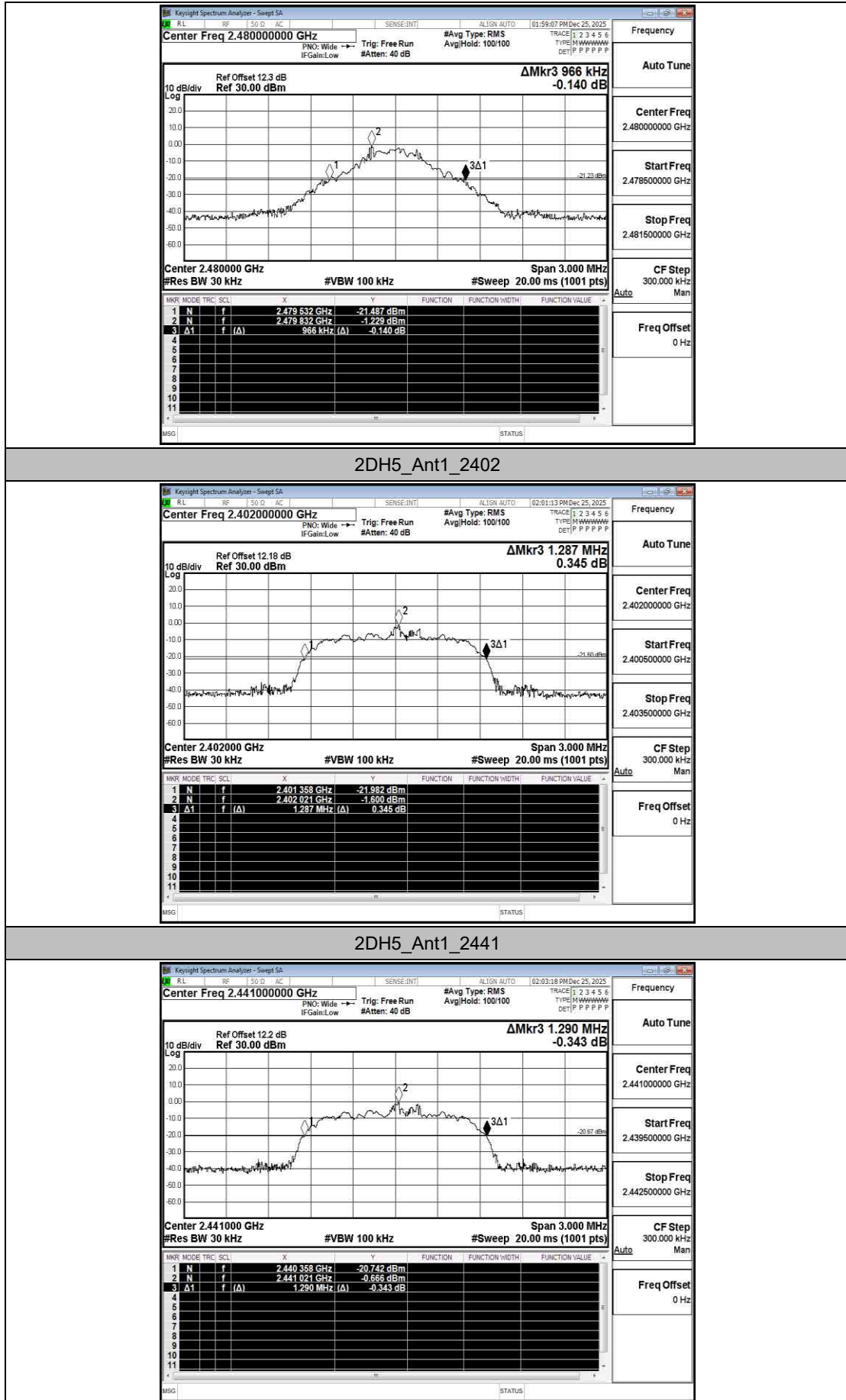
A.1 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	20dB EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.957	2401.532	2402.489	---	---
		2441	0.996	2440.487	2441.483	---	---
		2480	0.966	2479.532	2480.498	---	---
2DH5	Ant1	2402	1.287	2401.358	2402.645	---	---
		2441	1.290	2440.358	2441.648	---	---
		2480	1.296	2479.352	2480.648	---	---
3DH5	Ant1	2402	1.299	2401.346	2402.645	---	---
		2441	1.305	2440.340	2441.645	---	---
		2480	1.302	2479.343	2480.645	---	---

Test Graphs

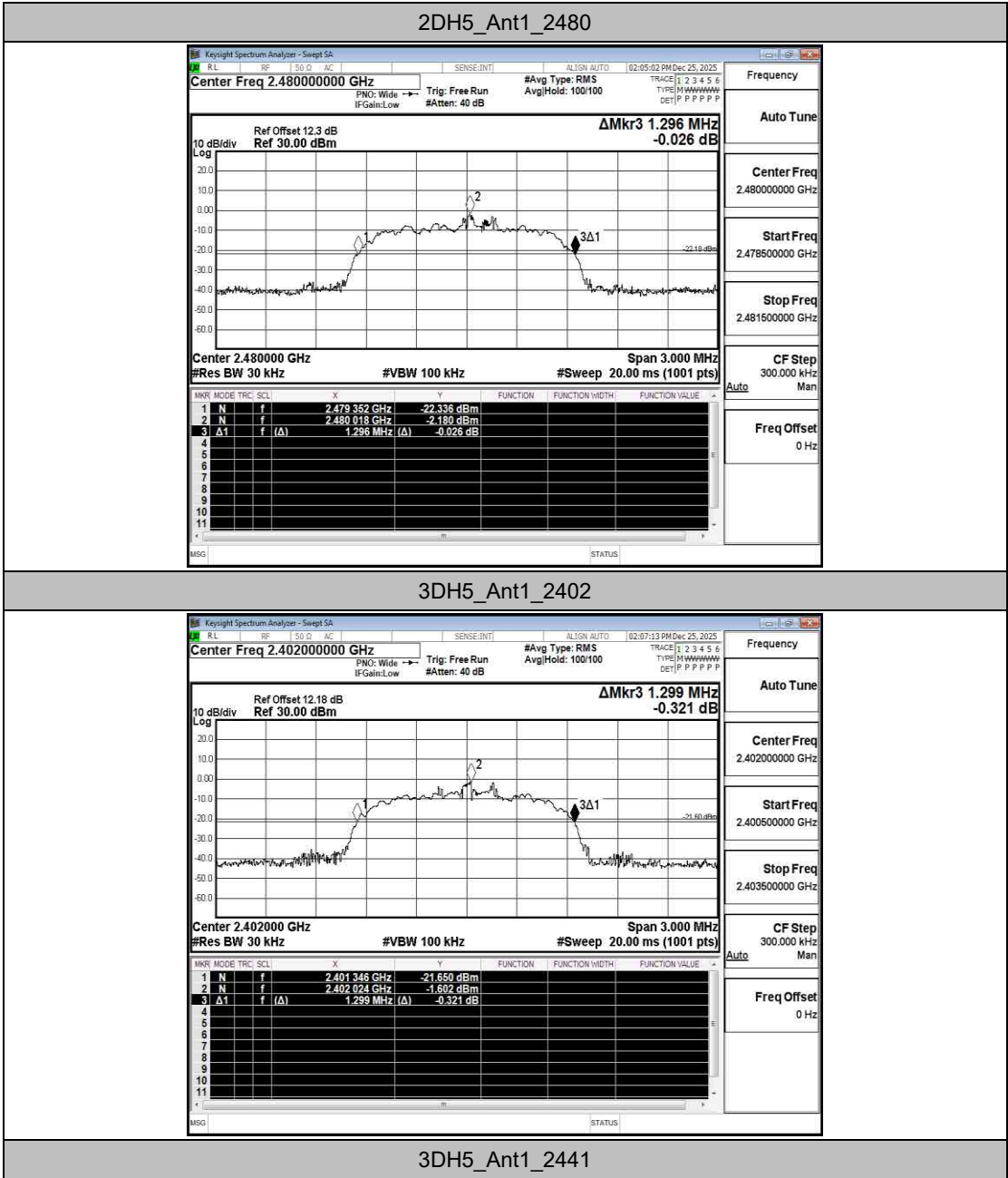


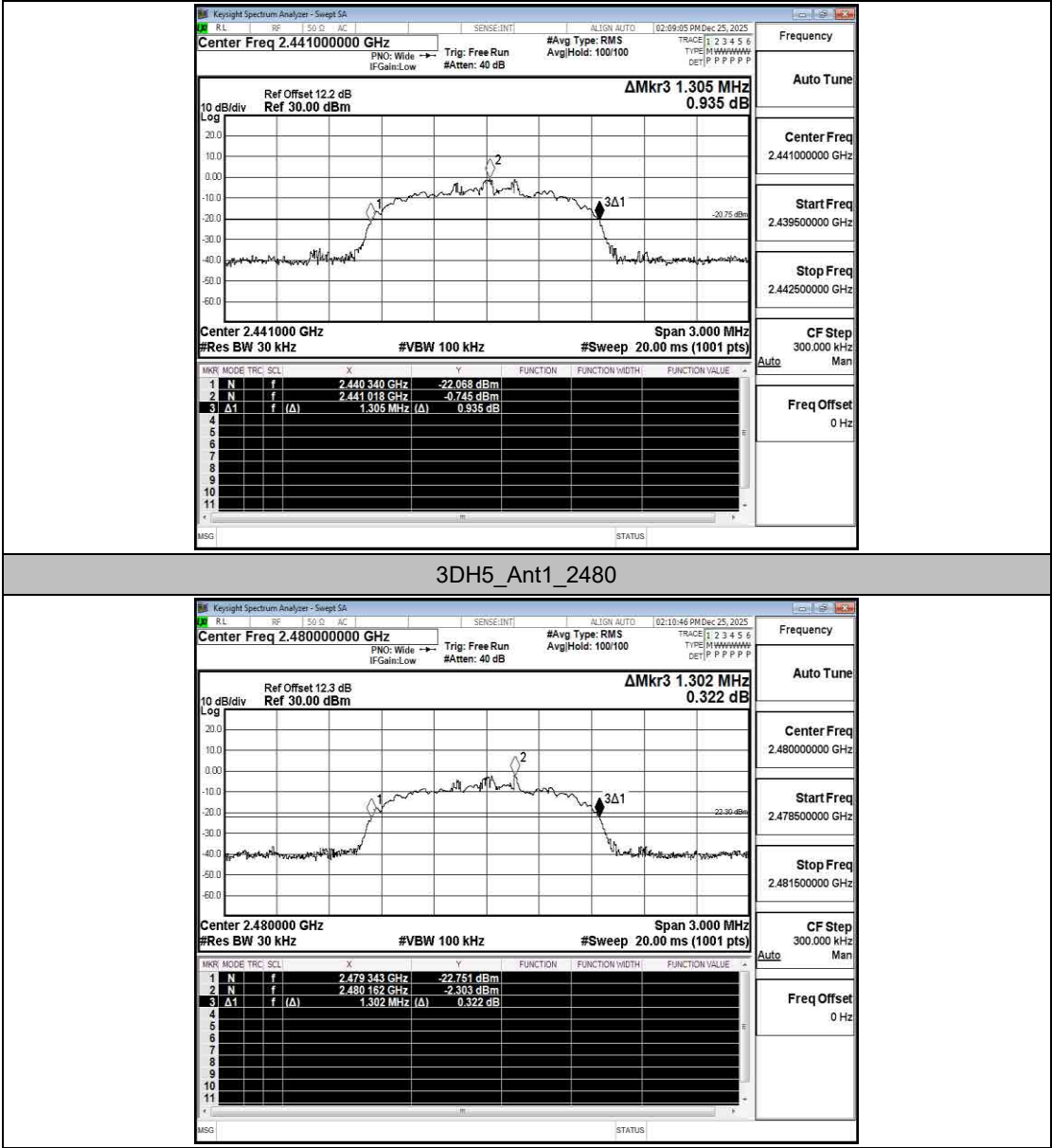


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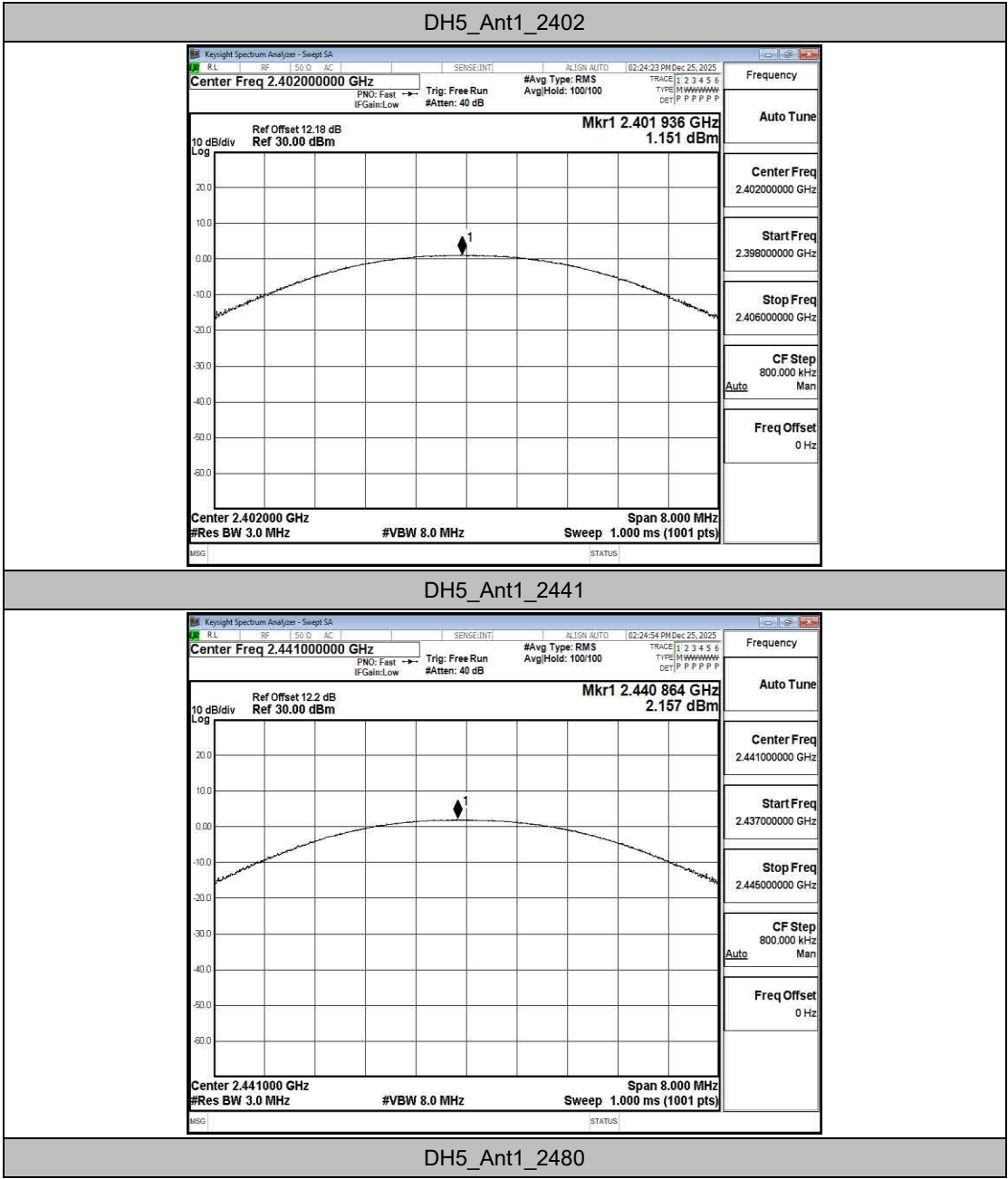


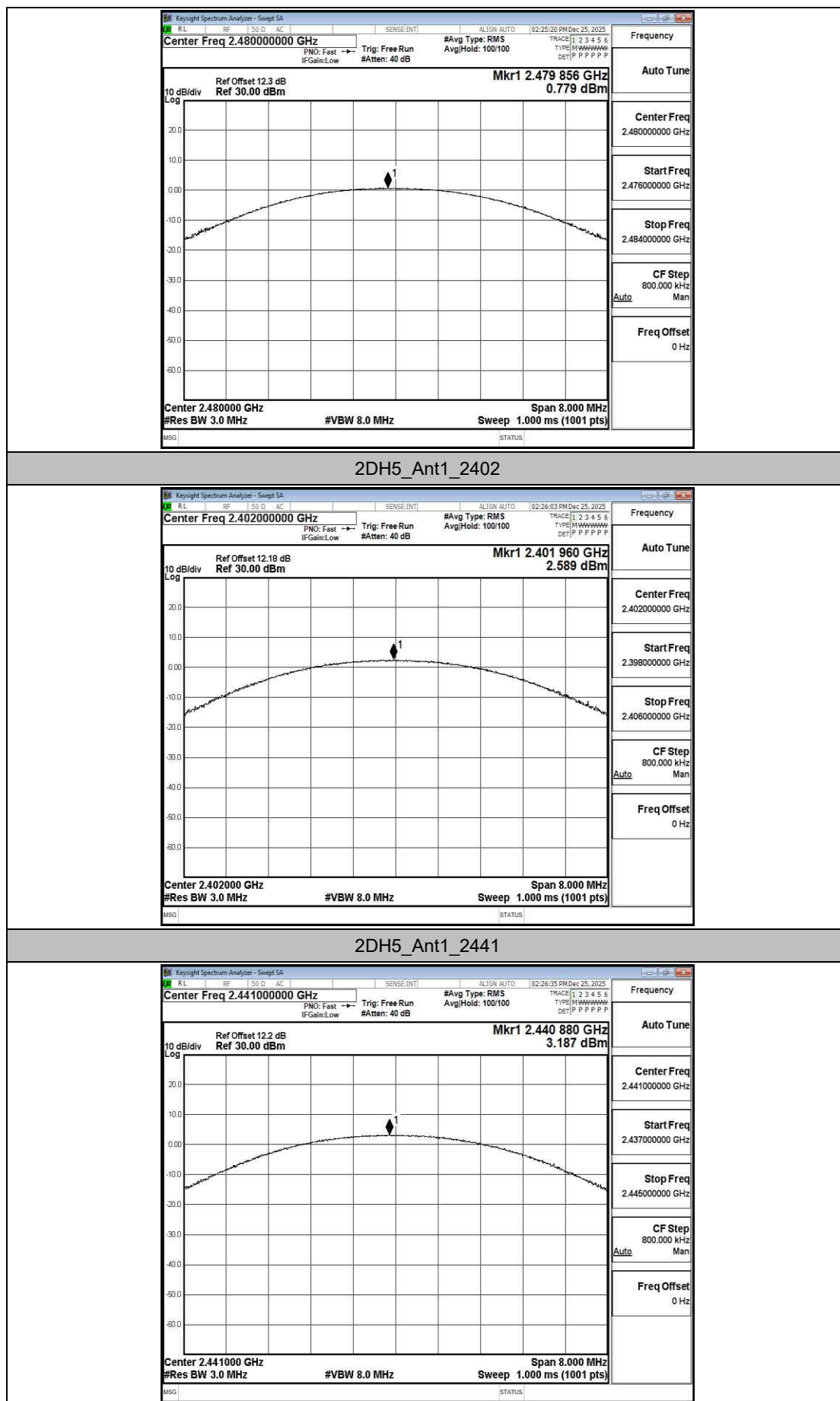
A.2 Maximum Peak conducted output power

Test Result Peak

Test Mode	Antenna	Freq(MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	1.15	≤20.97	PASS
		2441	2.16	≤20.97	PASS
		2480	0.78	≤20.97	PASS
2DH5	Ant1	2402	2.59	≤20.97	PASS
		2441	3.19	≤20.97	PASS
		2480	1.79	≤20.97	PASS
3DH5	Ant1	2402	2.69	≤20.97	PASS
		2441	3.56	≤20.97	PASS
		2480	1.94	≤20.97	PASS

Test Graphs



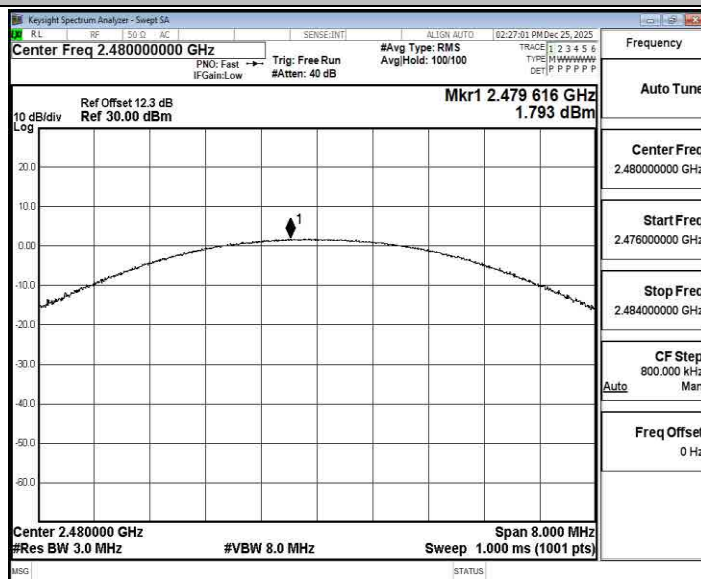


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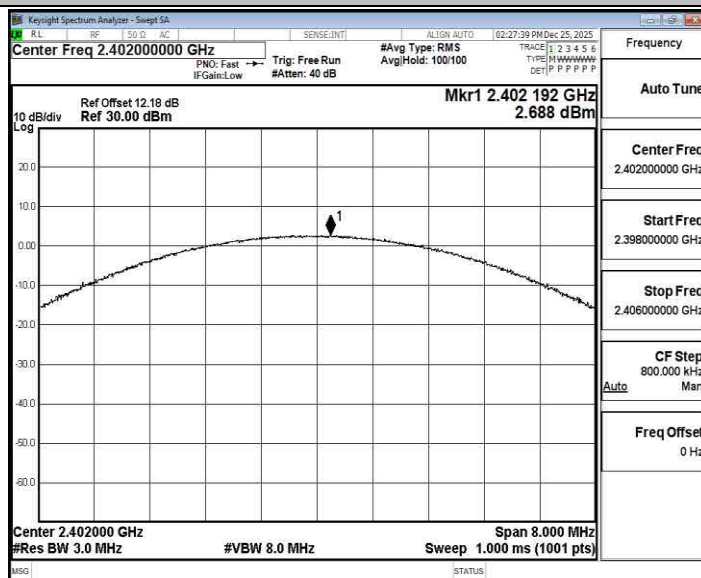
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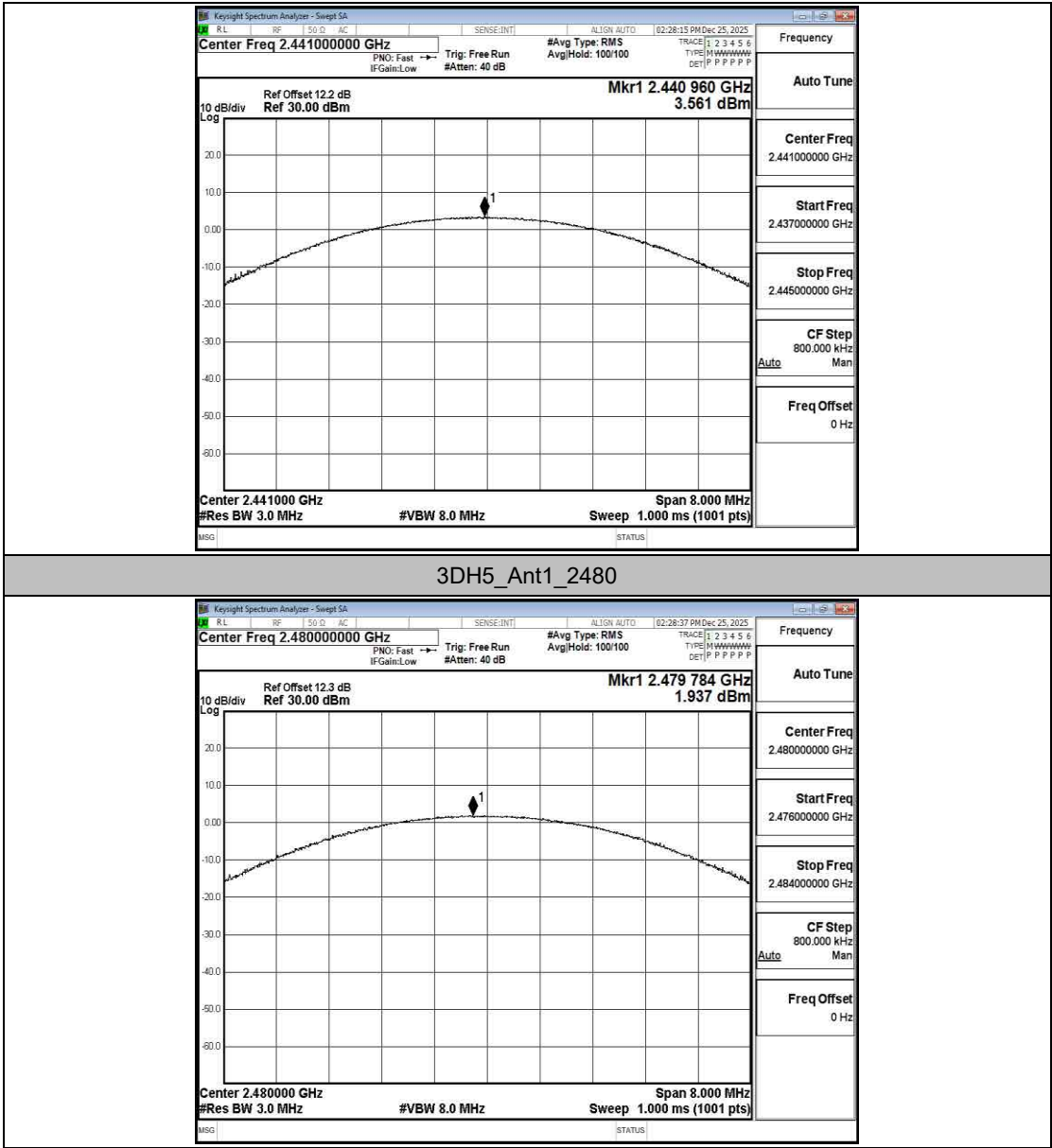
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441

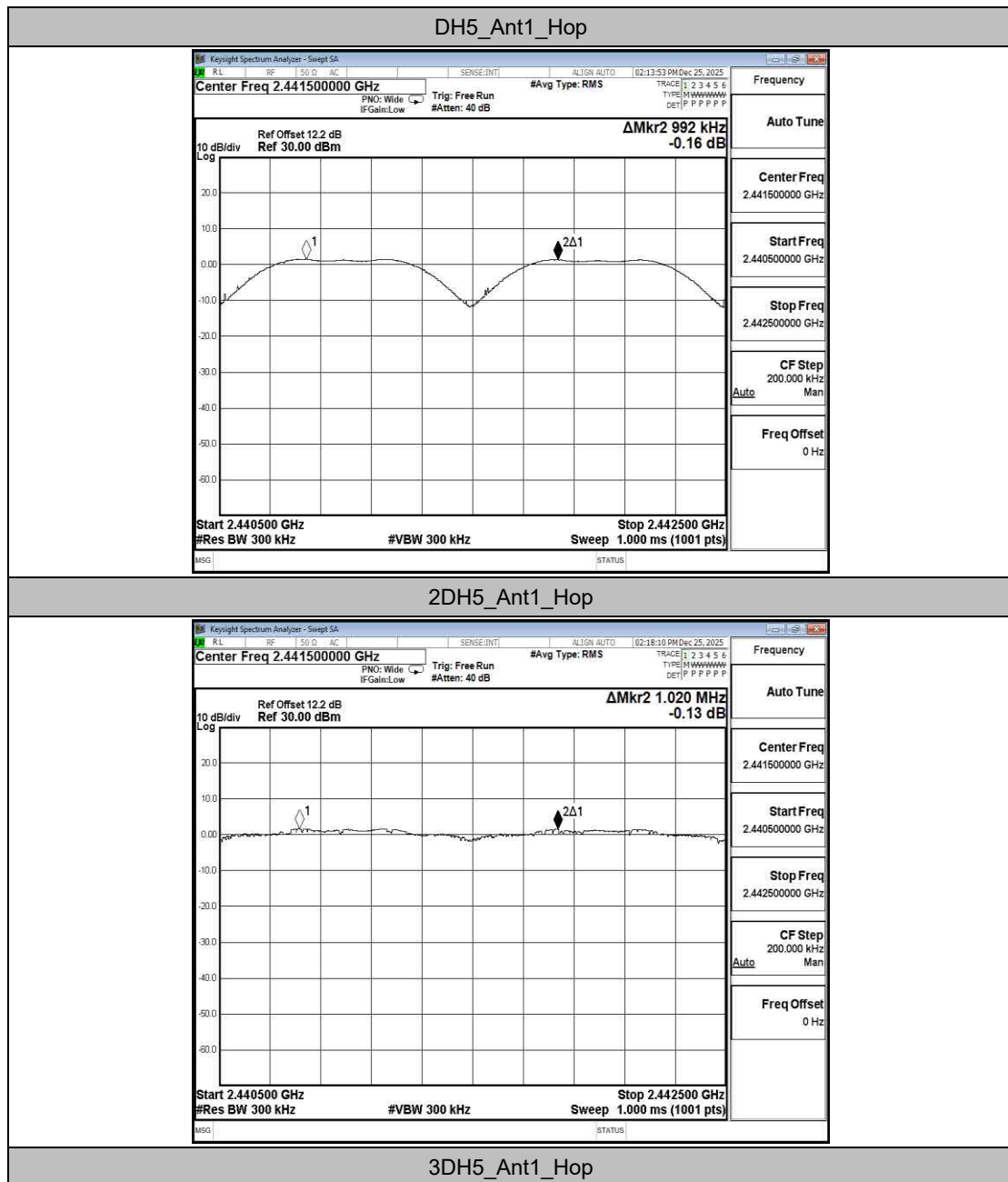


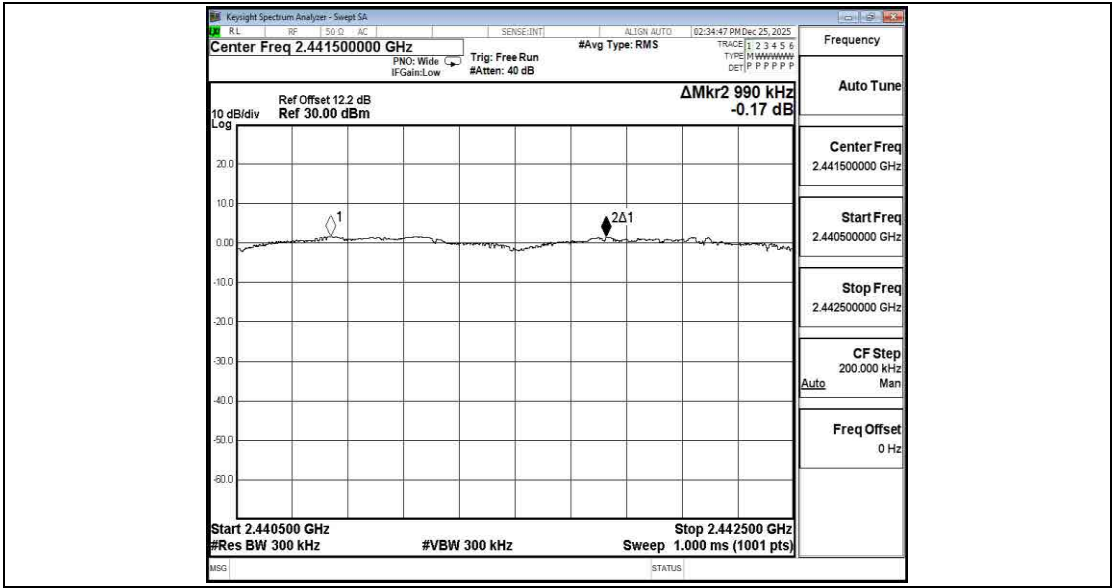
A.3 Carrier frequency separation

Test Result

TestMode	Antenna	Freq(MHz)	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.992	≥ 0.664	PASS
2DH5	Ant1	Hop	1.02	≥ 0.864	PASS
3DH5	Ant1	Hop	0.99	≥ 0.870	PASS

Test Graphs



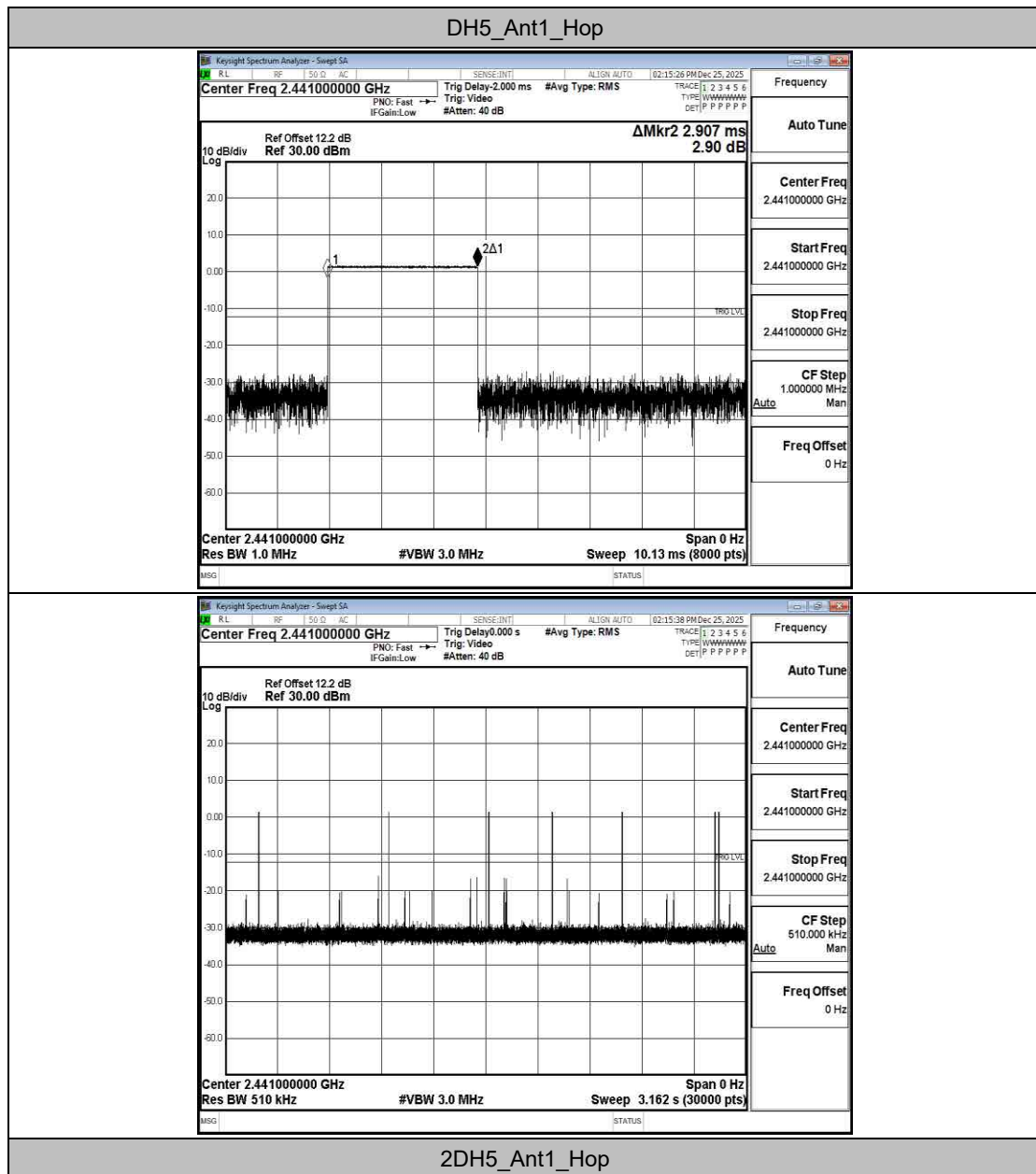


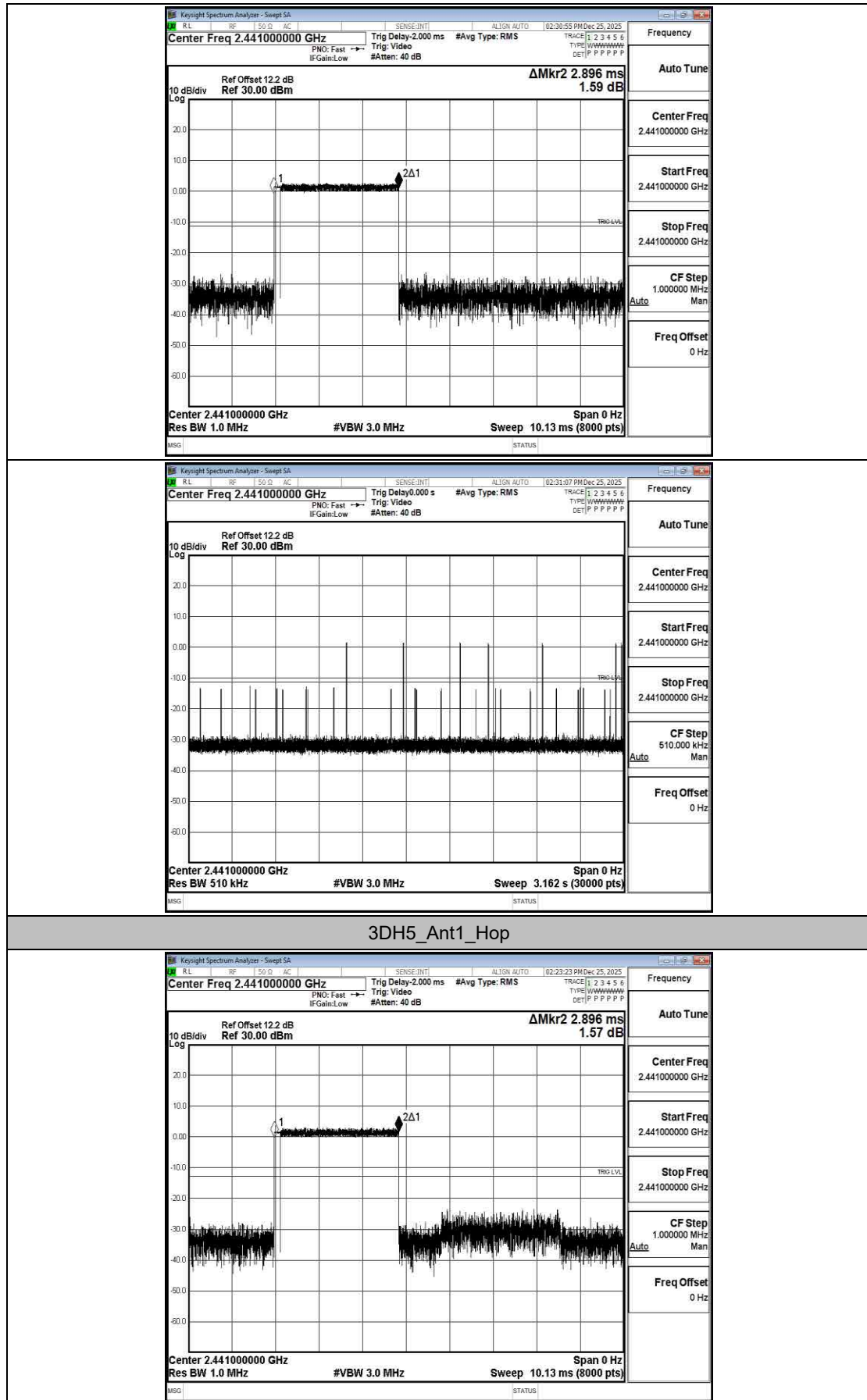
A.4 Time of occupancy

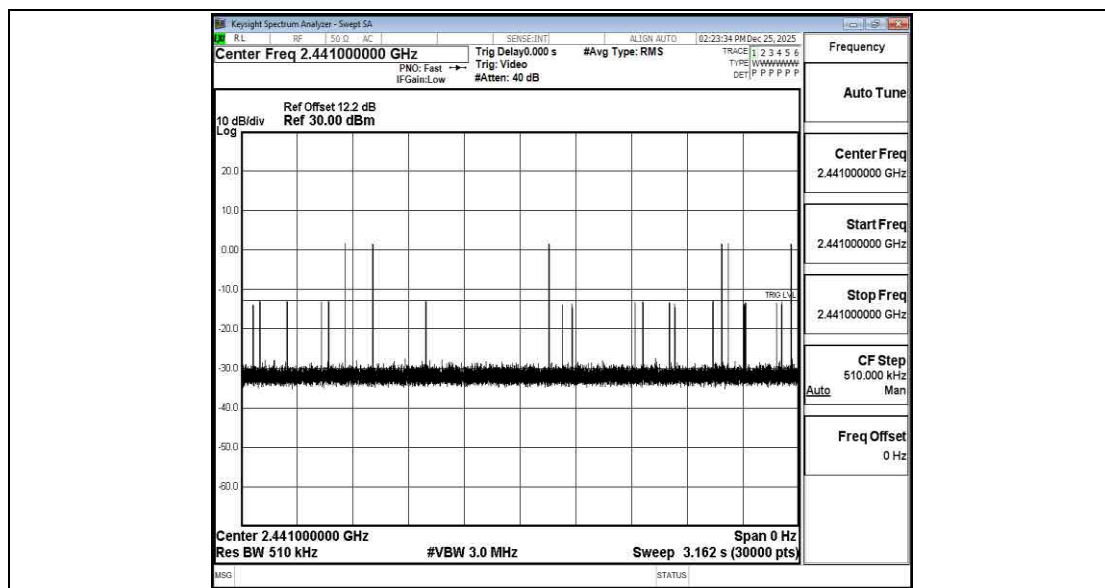
Test Result

TestMode	Antenna	Freq(MHz)	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.907	80	0.233	≤0.4	PASS
2DH5	Ant1	Hop	2.896	80	0.232	≤0.4	PASS
3DH5	Ant1	Hop	2.896	80	0.232	≤0.4	PASS

Test Graphs





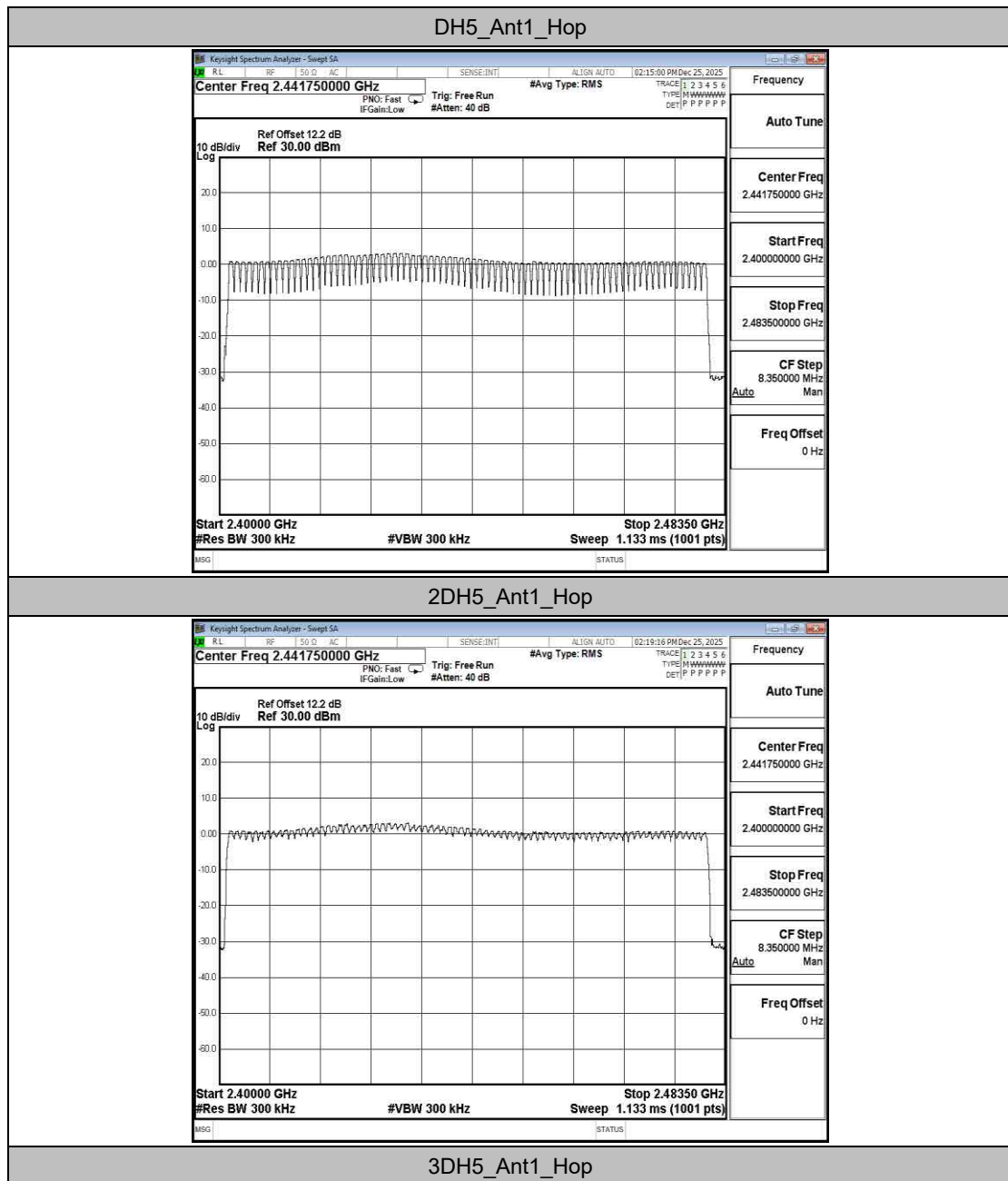


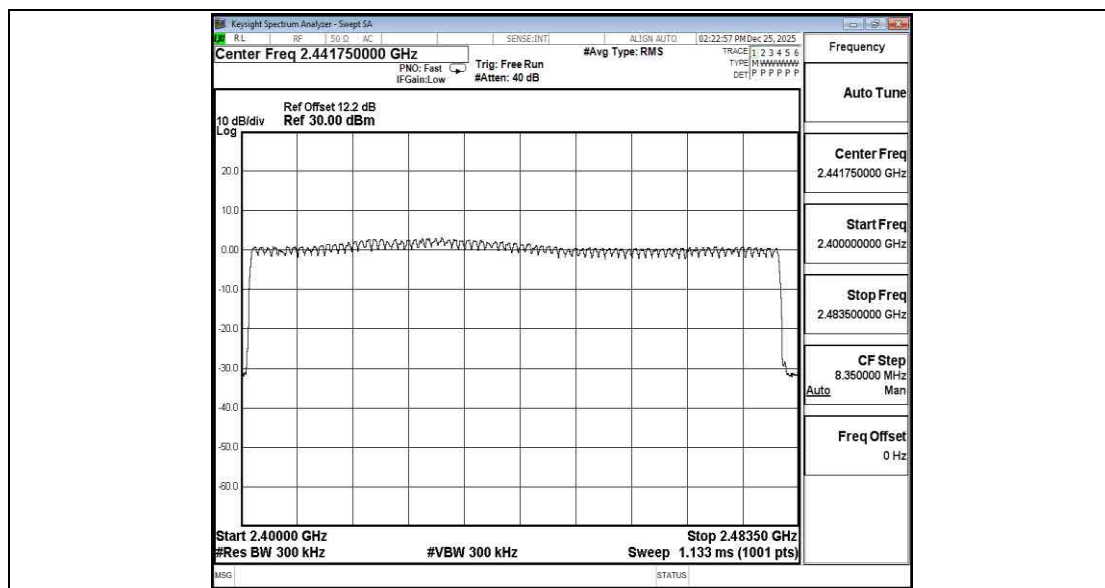
A.5 Number of hopping channels

Test Result

TestMode	Antenna	Freq(MHz)	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs



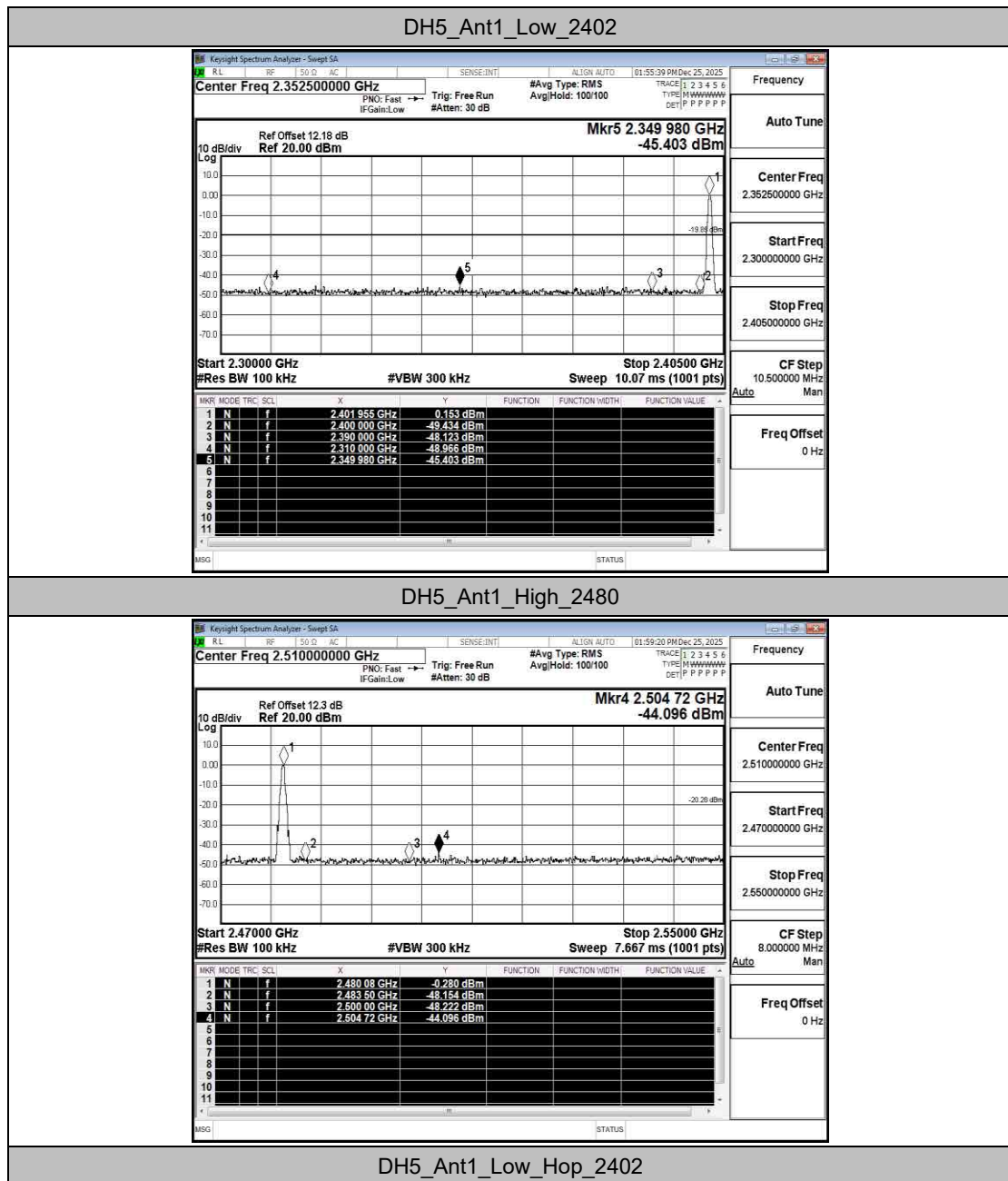


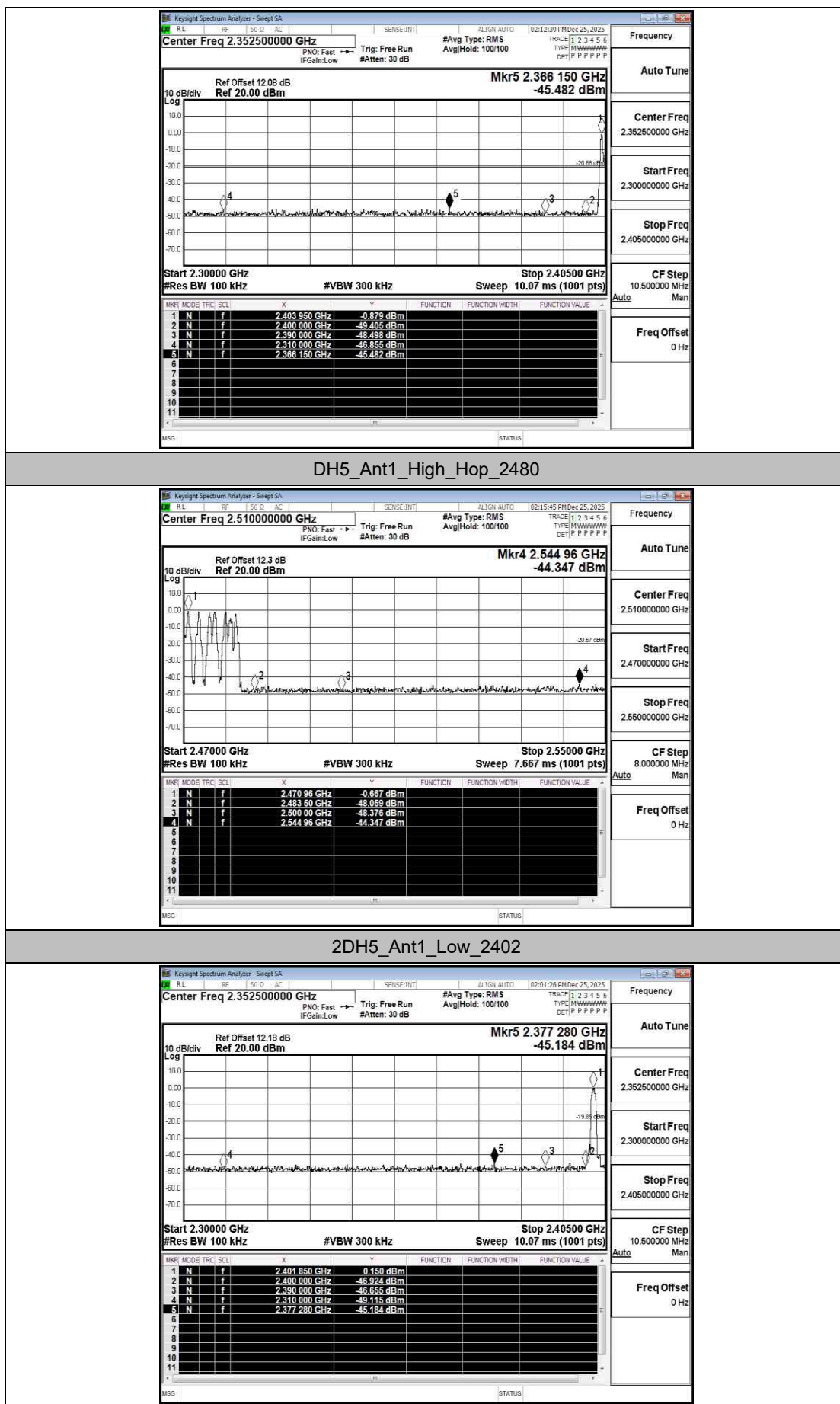
A.6 Band edge measurements

Test Result

TestMode	Antenna	ChName	Freq(MHz)	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	0.15	-45.4	≤-19.85	PASS
		High	2480	-0.28	-44.1	≤-20.28	PASS
		Low	Hop_2402	-0.88	-45.48	≤-20.88	PASS
		High	Hop_2480	-0.67	-44.35	≤-20.67	PASS
2DH5	Ant1	Low	2402	0.15	-45.18	≤-19.85	PASS
		High	2480	-1.06	-45.28	≤-21.06	PASS
		Low	Hop_2402	-2.76	-45.38	≤-22.76	PASS
		High	Hop_2480	-2.62	-45.04	≤-22.62	PASS
3DH5	Ant1	Low	2402	0.52	-44.67	≤-19.48	PASS
		High	2480	-2.21	-44.84	≤-22.21	PASS
		Low	Hop_2402	-3.94	-43.84	≤-23.94	PASS
		High	Hop_2480	-2.73	-44.89	≤-22.73	PASS

Test Graphs



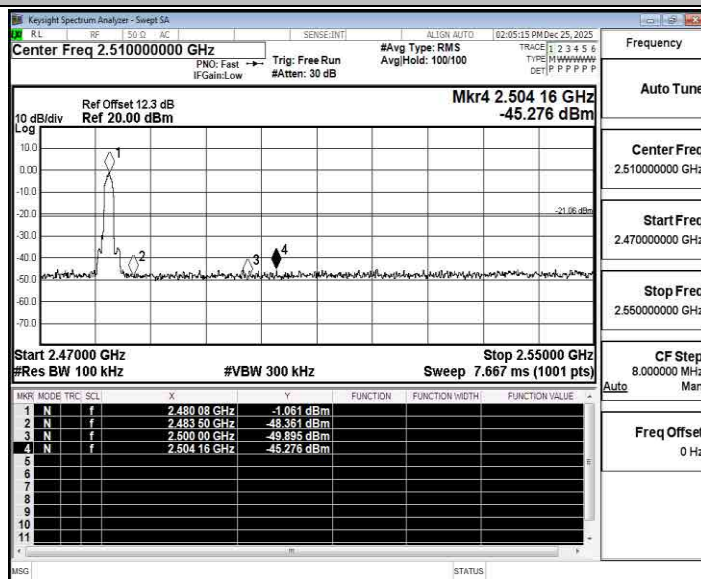


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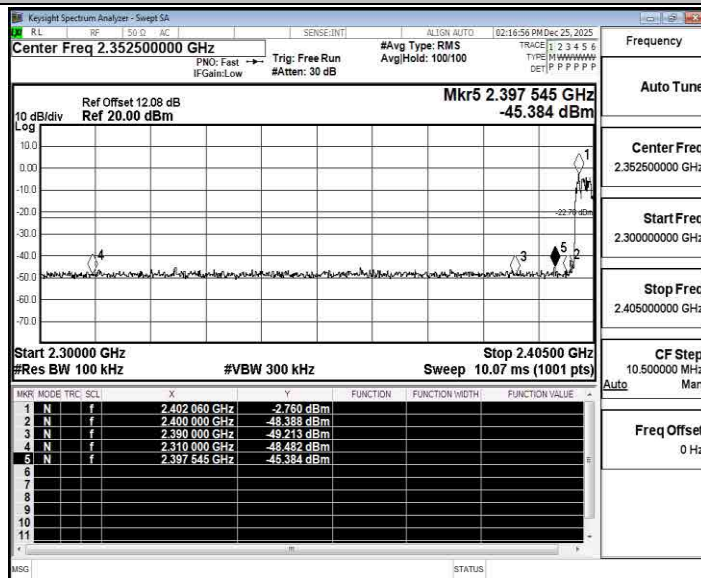
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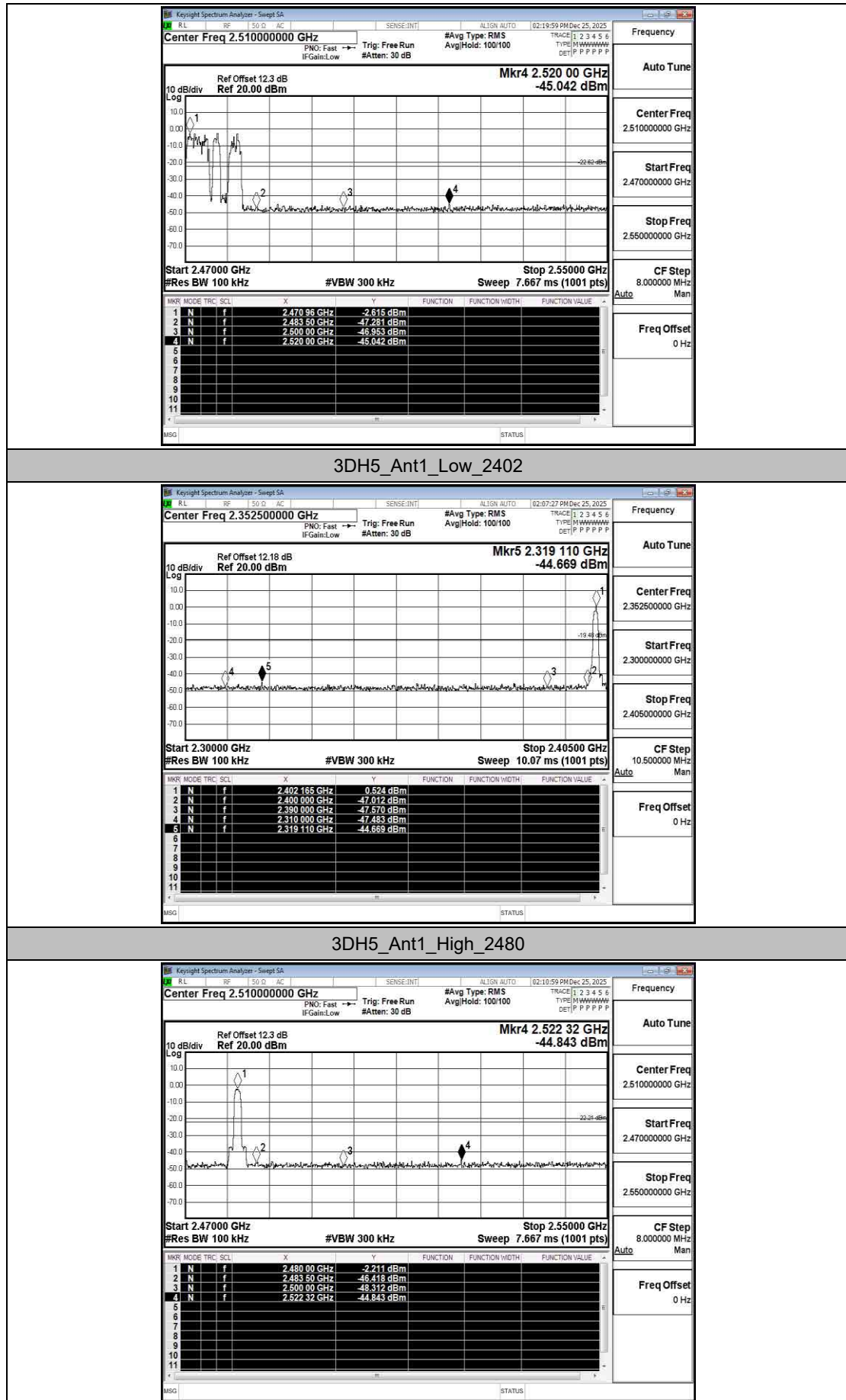
2DH5_Ant1_High_2480



2DH5_Ant1_Low_Hop_2402



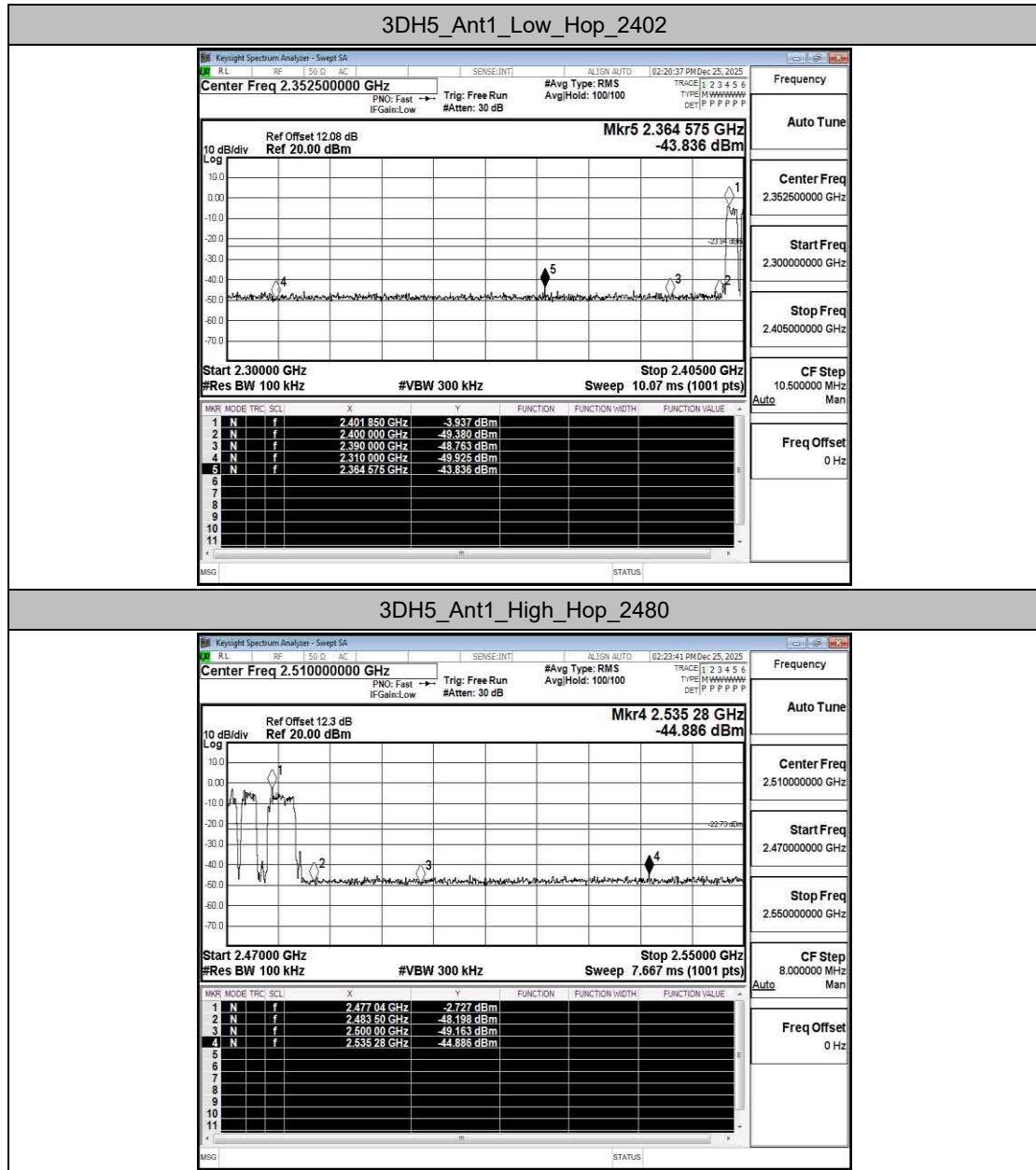
2DH5_Ant1_High_Hop_2480



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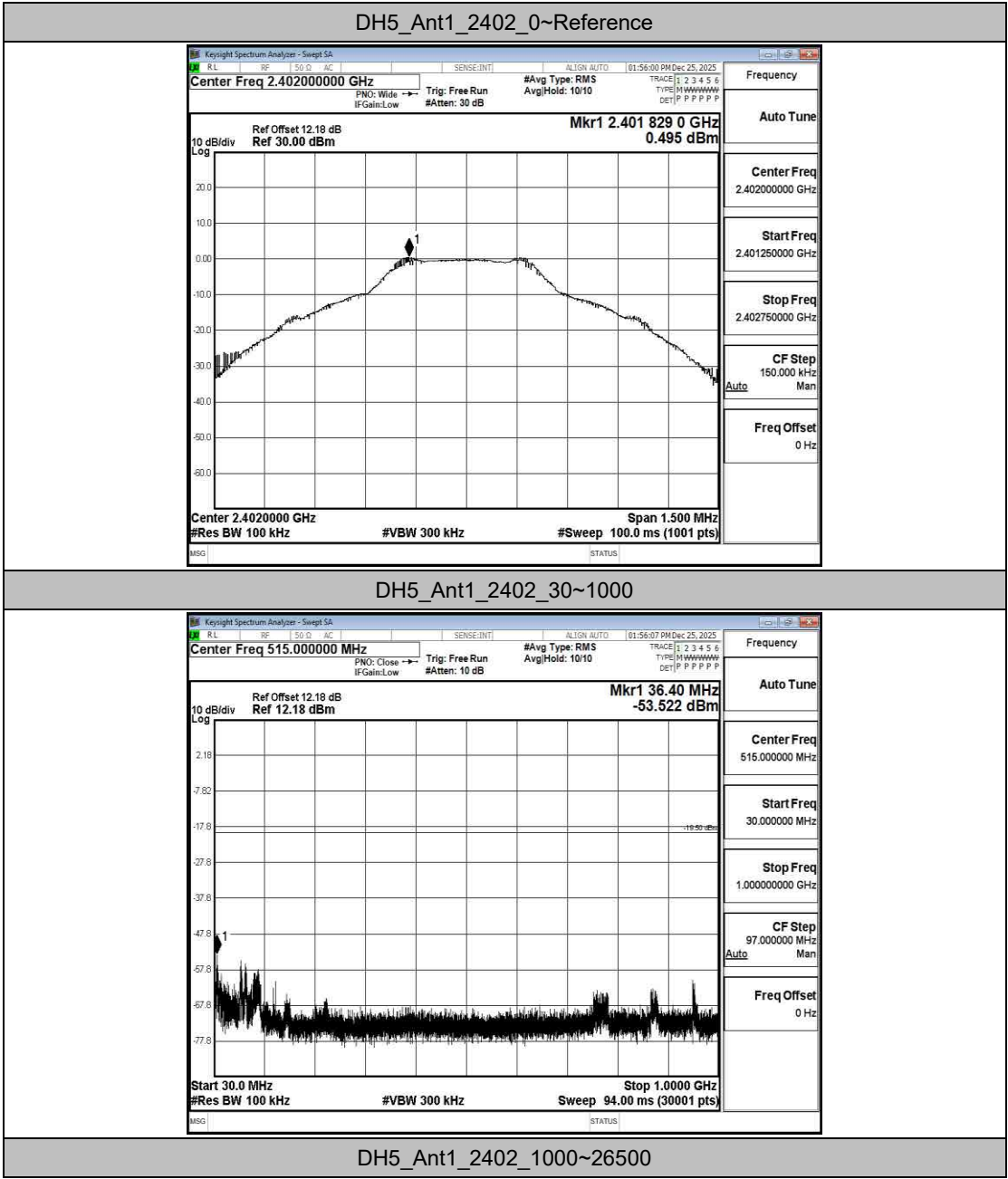


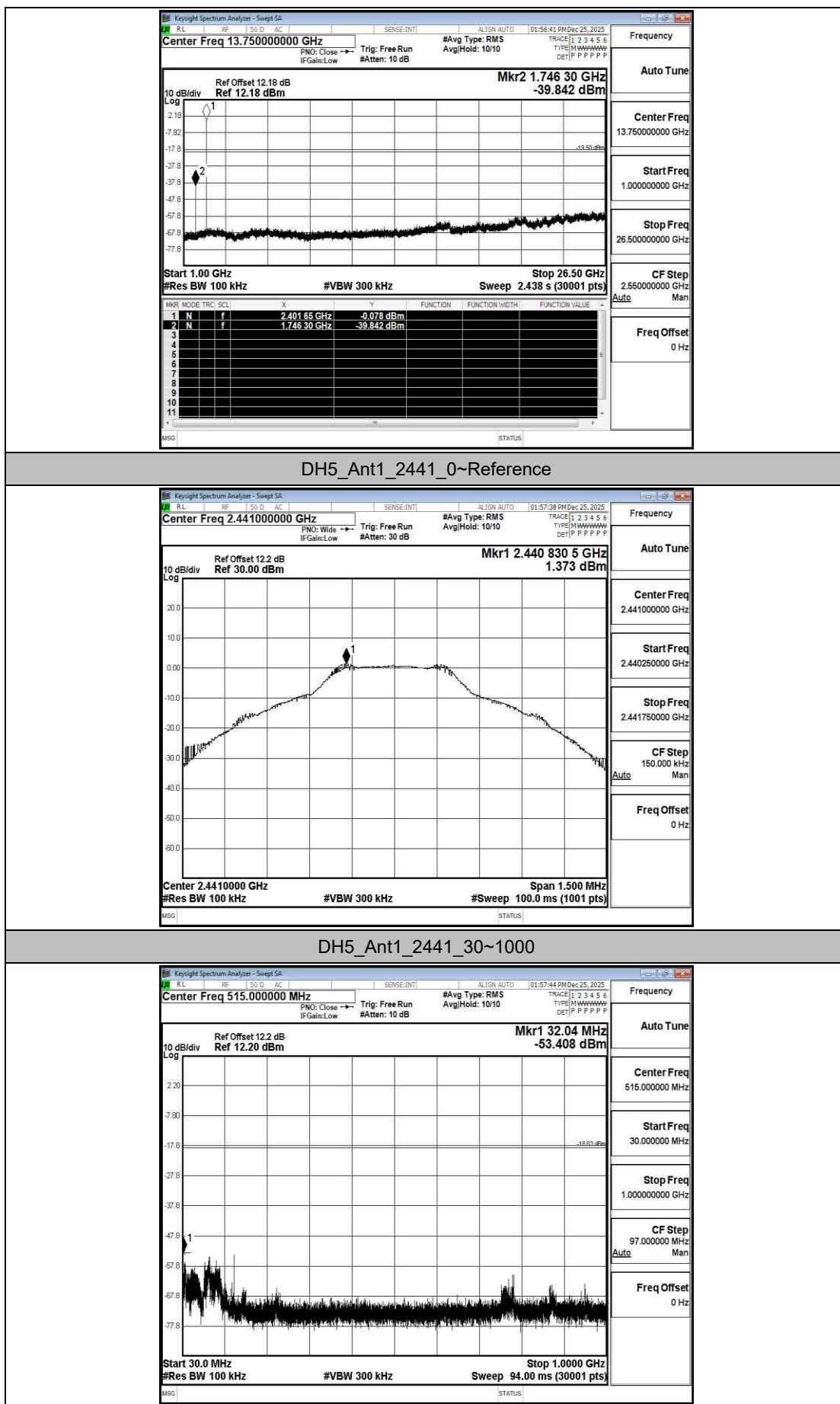
A.7 Conducted Spurious Emission

Test Result

TestMode	Antenna	Freq(MHz)	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	0.50	0.50	---	PASS
			30~1000	0.50	-53.52	≤-19.5	PASS
			1000~26500	0.50	-39.84	≤-19.5	PASS
		2441	Reference	1.37	1.37	---	PASS
			30~1000	1.37	-53.41	≤-18.63	PASS
			1000~26500	1.37	-34.67	≤-18.63	PASS
		2480	Reference	0.04	0.04	---	PASS
			30~1000	0.04	-55.06	≤-19.96	PASS
			1000~26500	0.04	-54.71	≤-19.96	PASS
2DH5	Ant1	2402	Reference	0.38	0.38	---	PASS
			30~1000	0.38	-54.75	≤-19.62	PASS
			1000~26500	0.38	-37.67	≤-19.62	PASS
		2441	Reference	1.27	1.27	---	PASS
			30~1000	1.27	-54.64	≤-18.73	PASS
			1000~26500	1.27	-36.39	≤-18.73	PASS
		2480	Reference	-0.08	-0.08	---	PASS
			30~1000	-0.08	-54.09	≤-20.08	PASS
			1000~26500	-0.08	-54.76	≤-20.08	PASS
3DH5	Ant1	2402	Reference	0.53	0.53	---	PASS
			30~1000	0.53	-54.35	≤-19.47	PASS
			1000~26500	0.53	-55.11	≤-19.47	PASS
		2441	Reference	1.43	1.43	---	PASS
			30~1000	1.43	-52.95	≤-18.57	PASS
			1000~26500	1.43	-55.27	≤-18.57	PASS
		2480	Reference	0.17	0.17	---	PASS
			30~1000	0.17	-54.64	≤-19.83	PASS
			1000~26500	0.17	-54.4	≤-19.83	PASS

Test Graphs

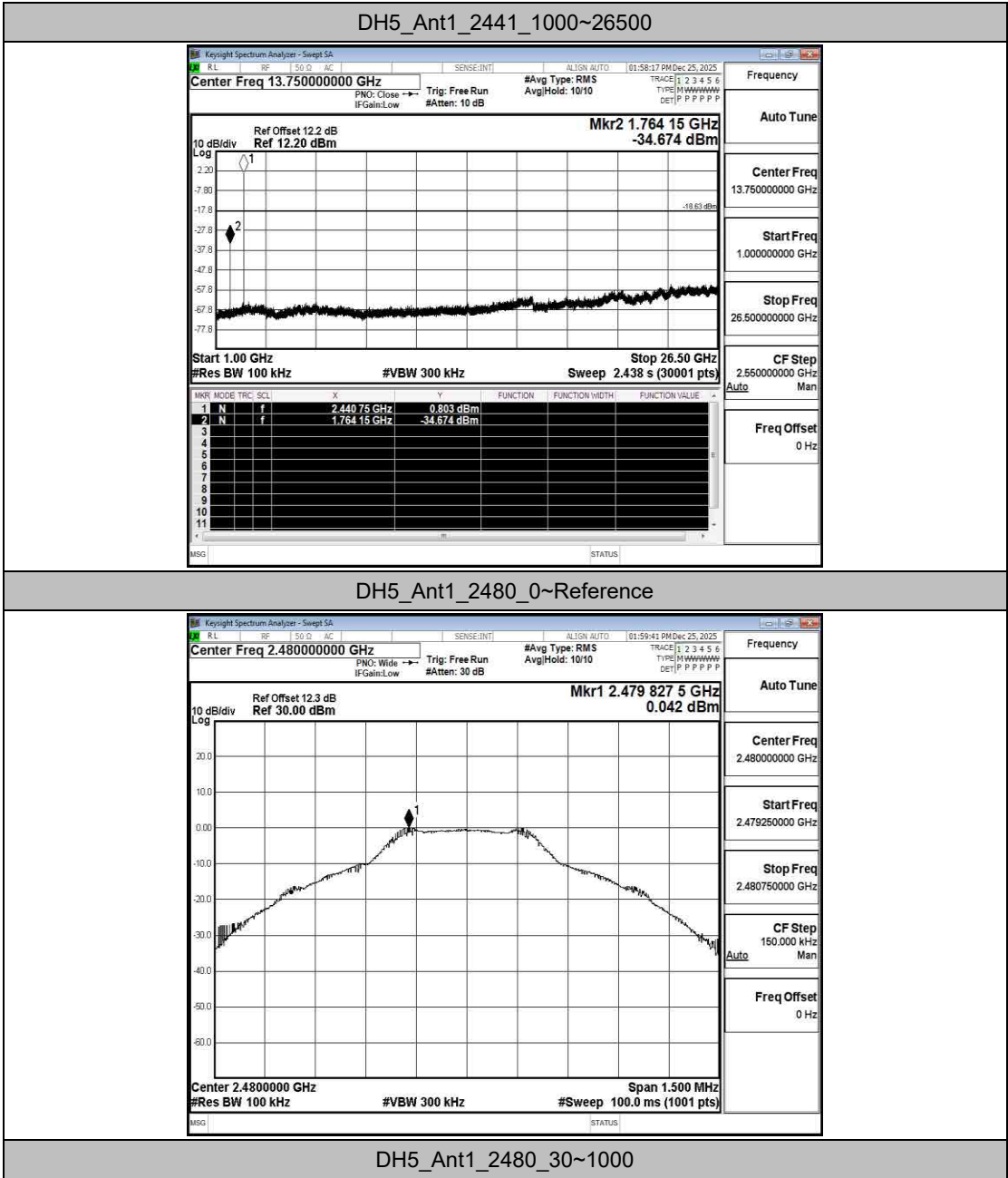


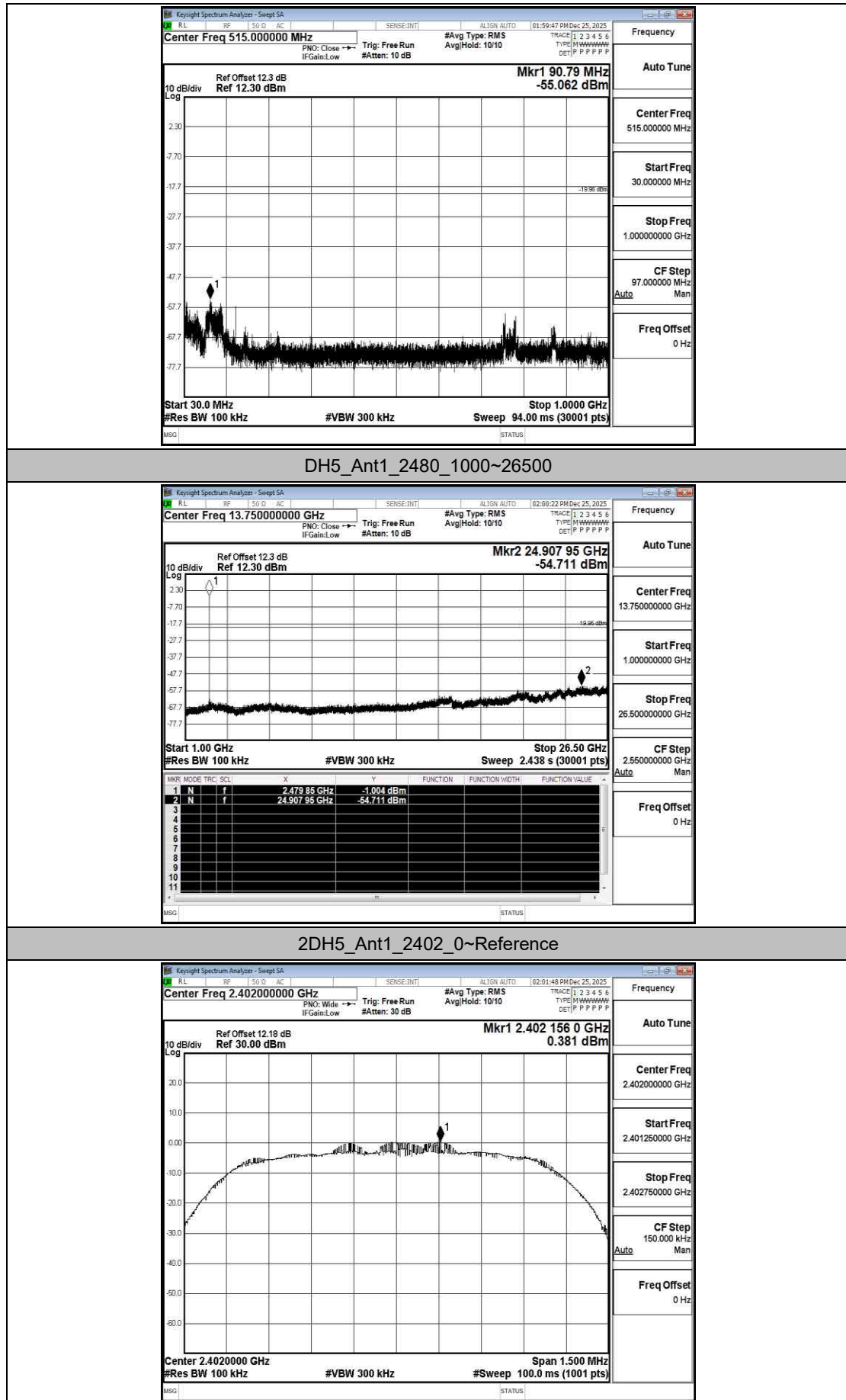


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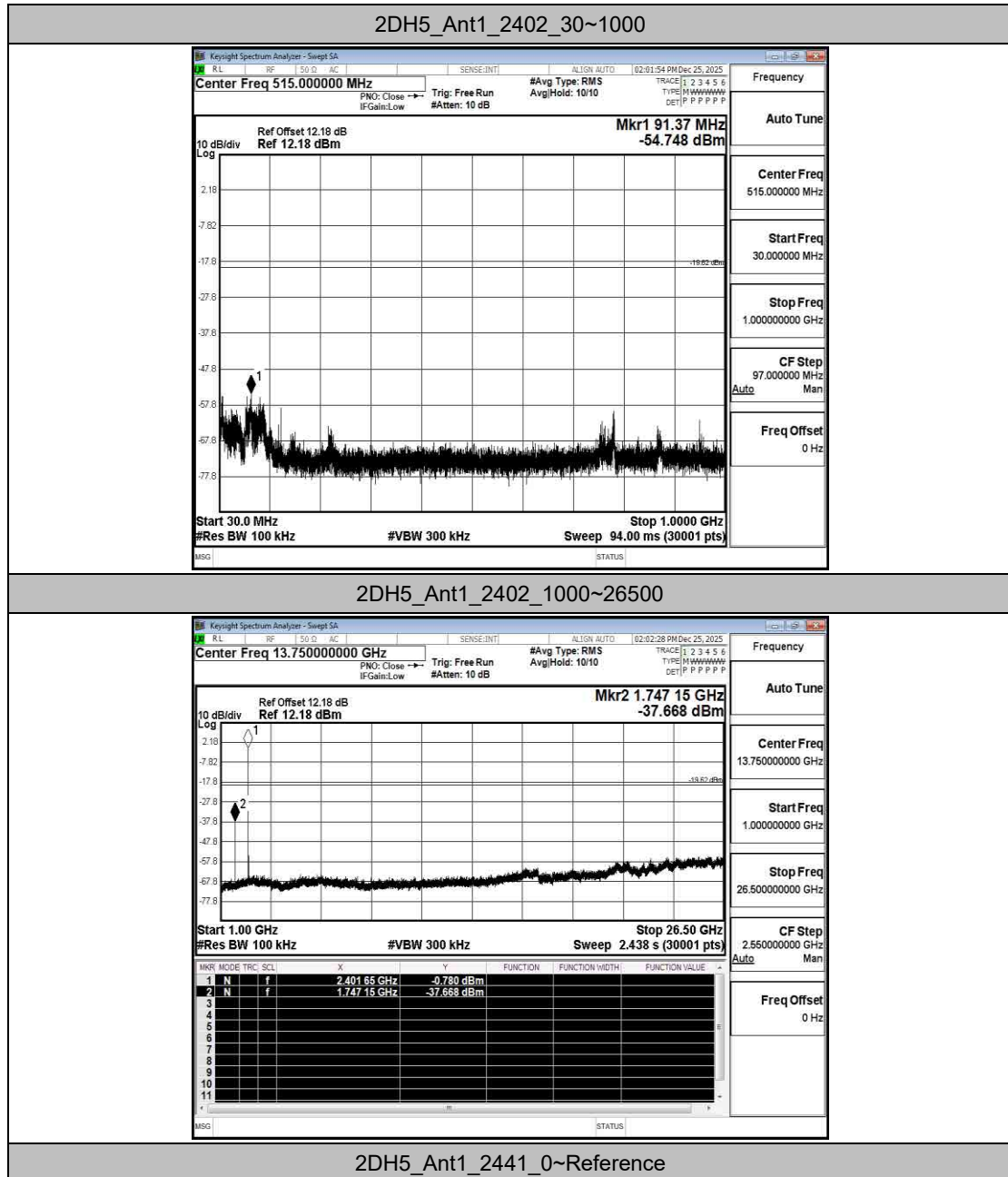


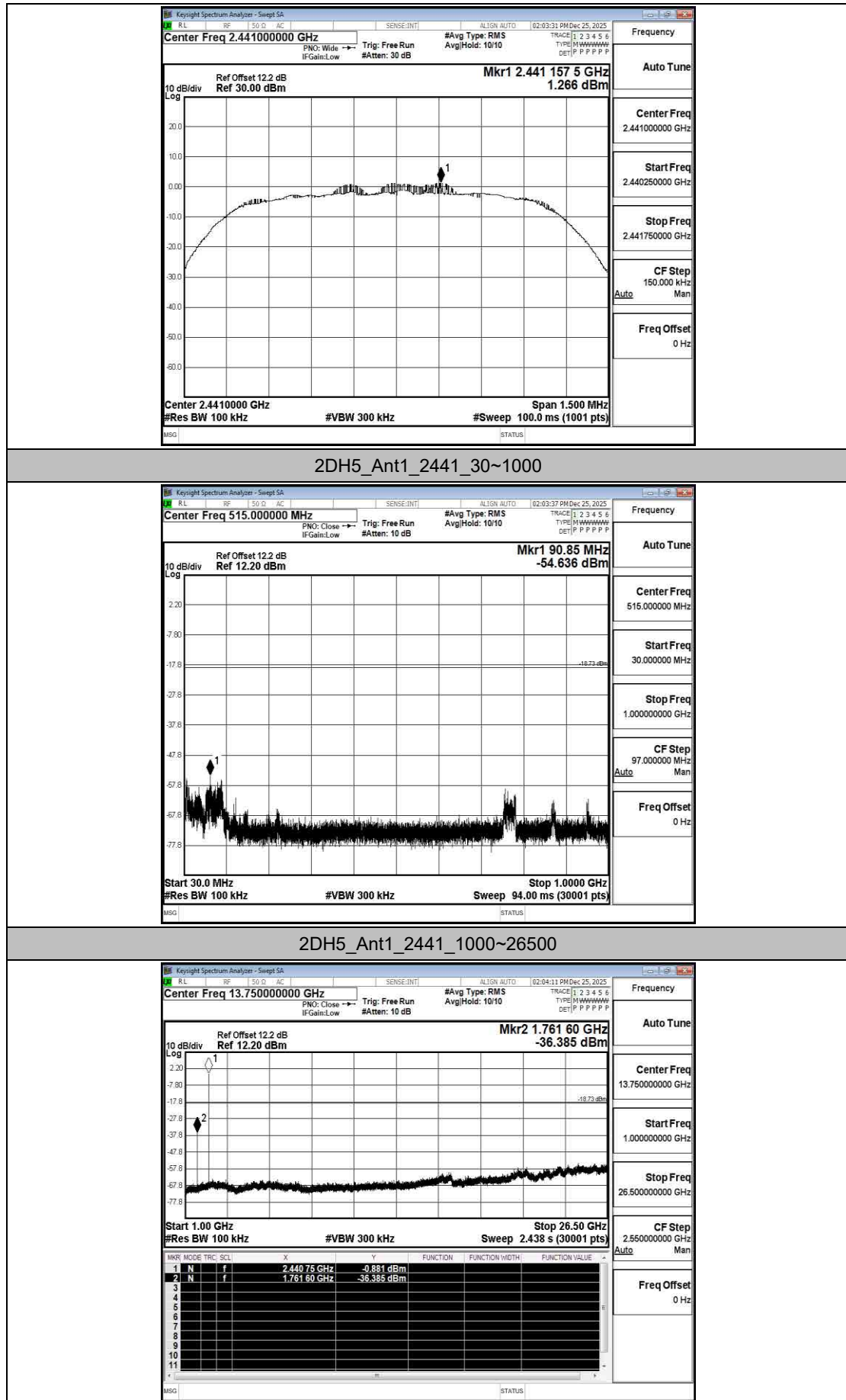


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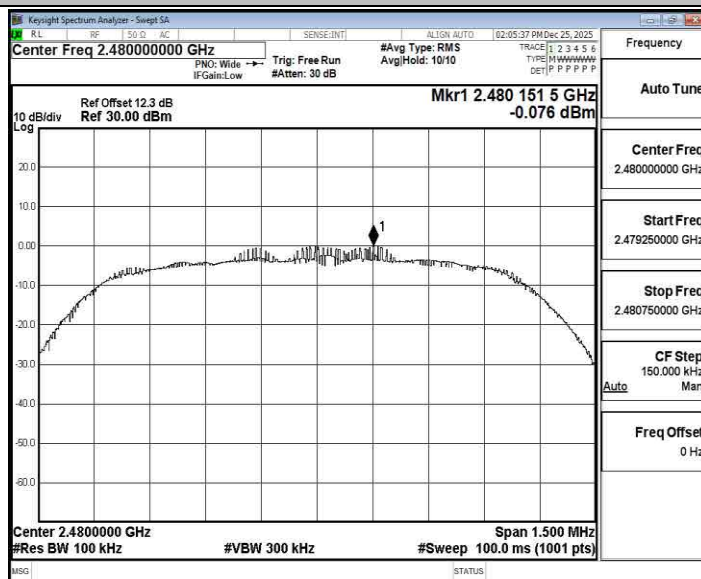


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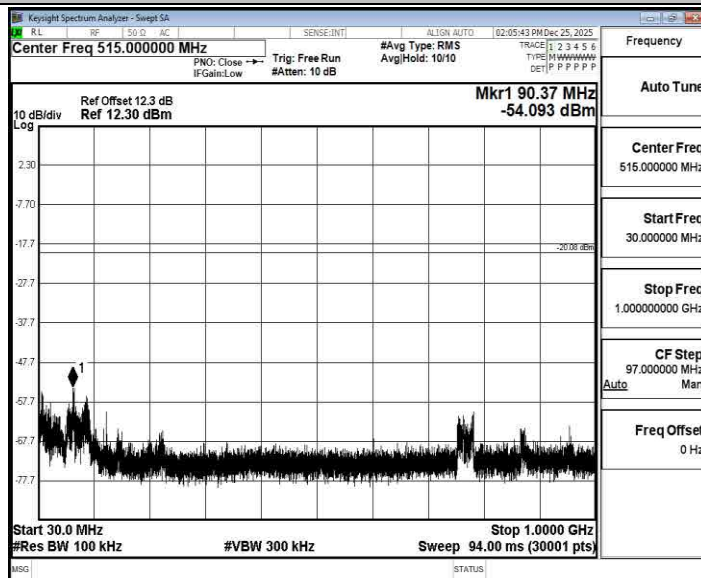
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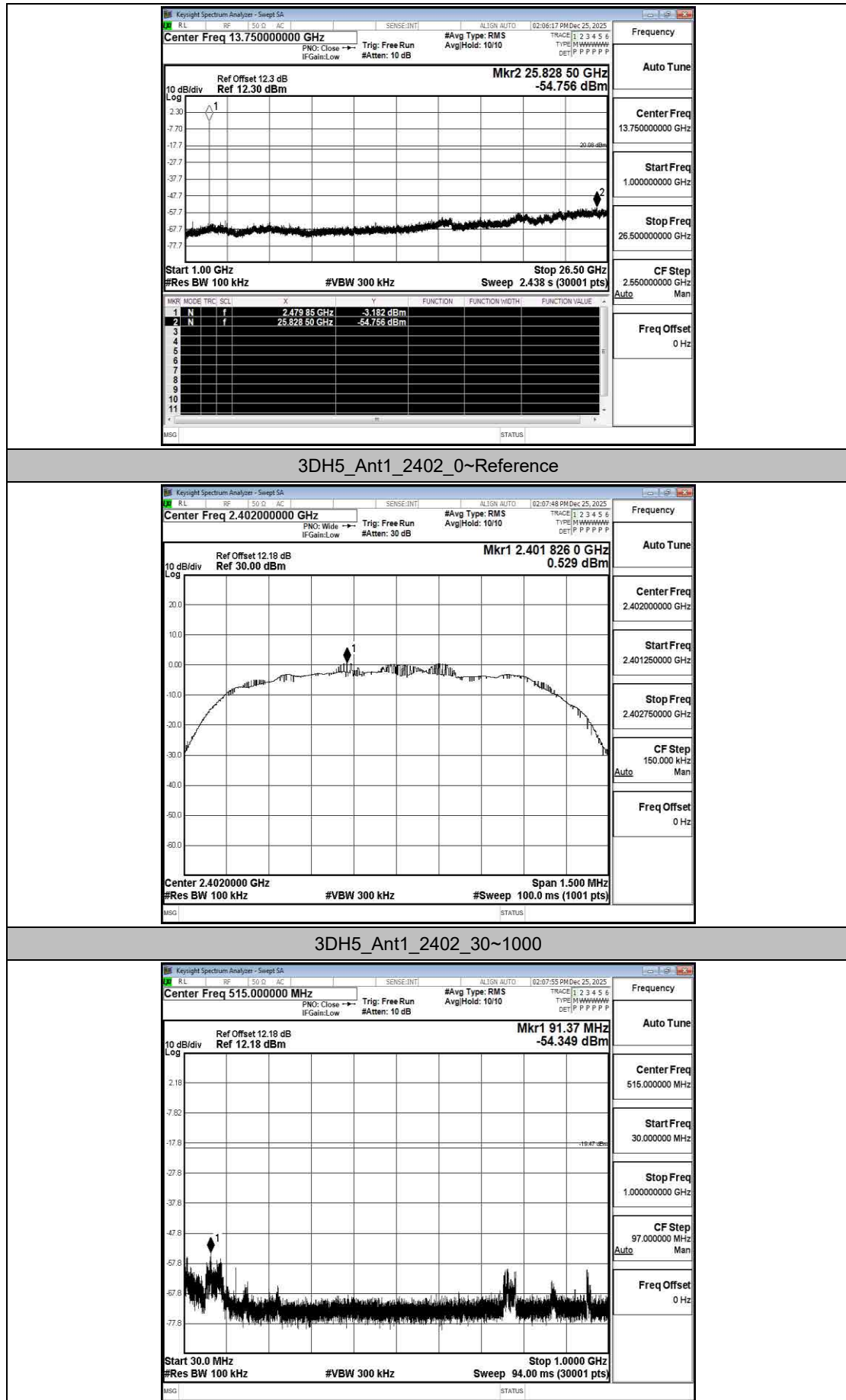
2DH5_Ant1_2480_0~Reference



2DH5_Ant1_2480_30~1000



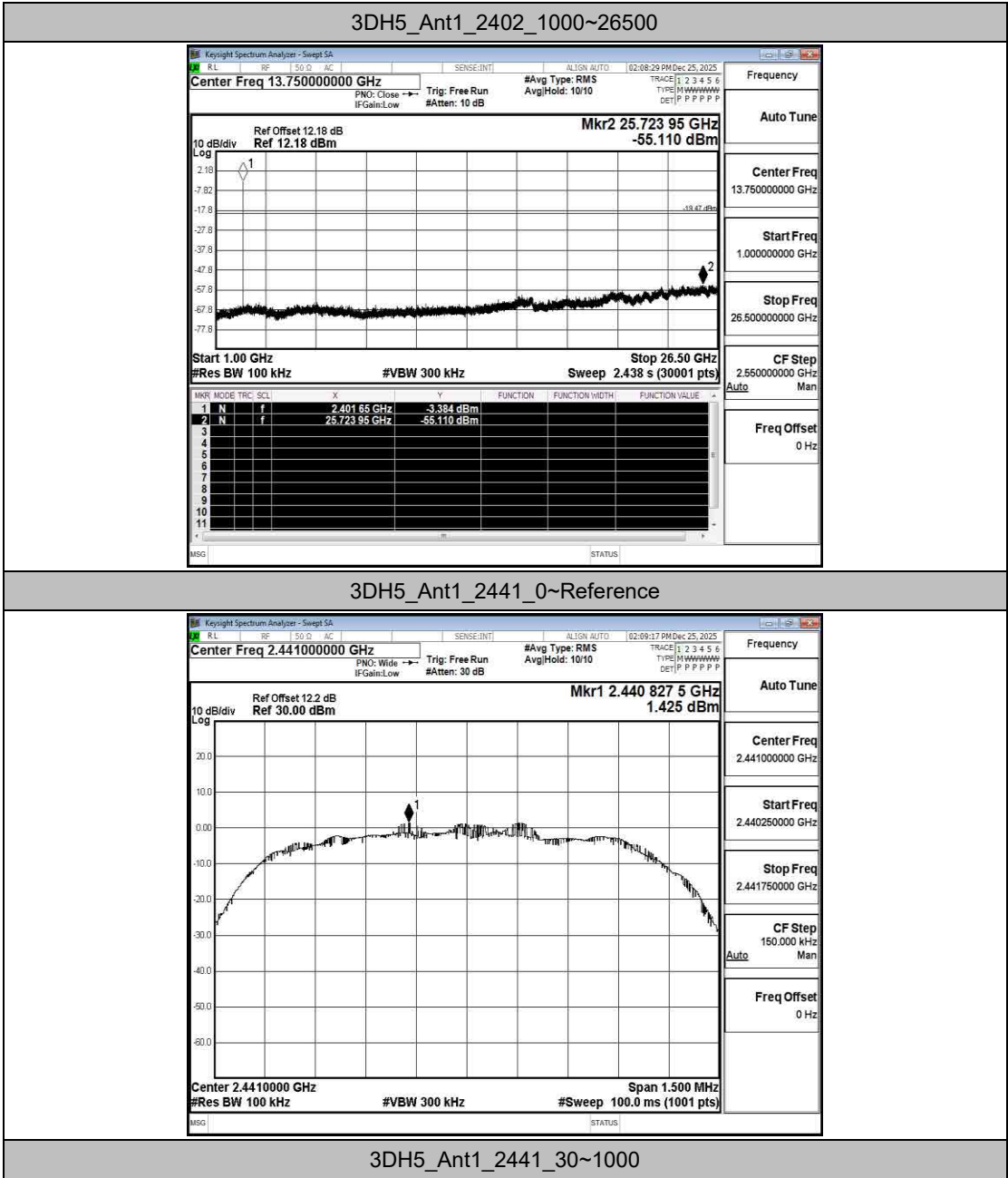
2DH5_Ant1_2480_1000~26500

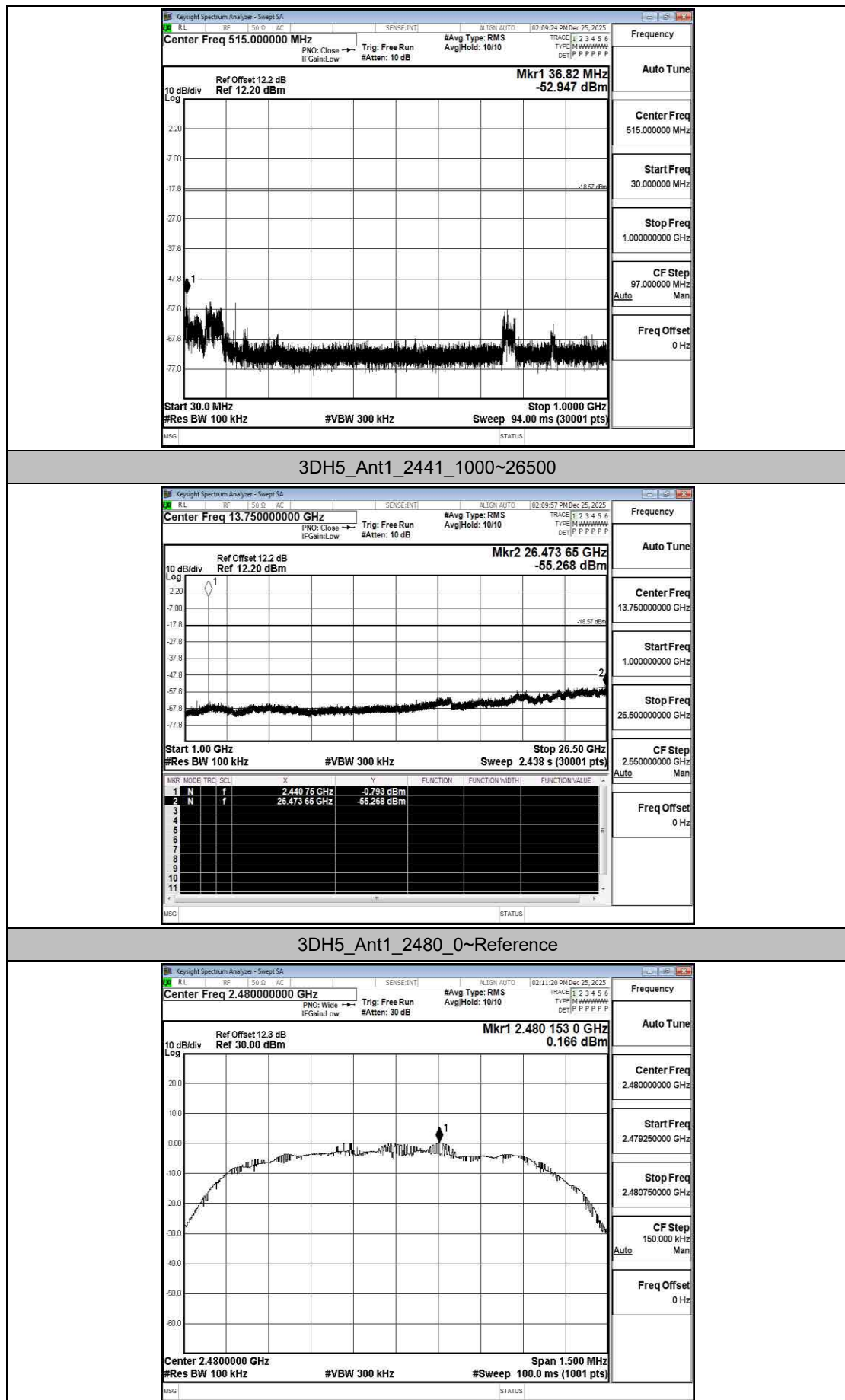


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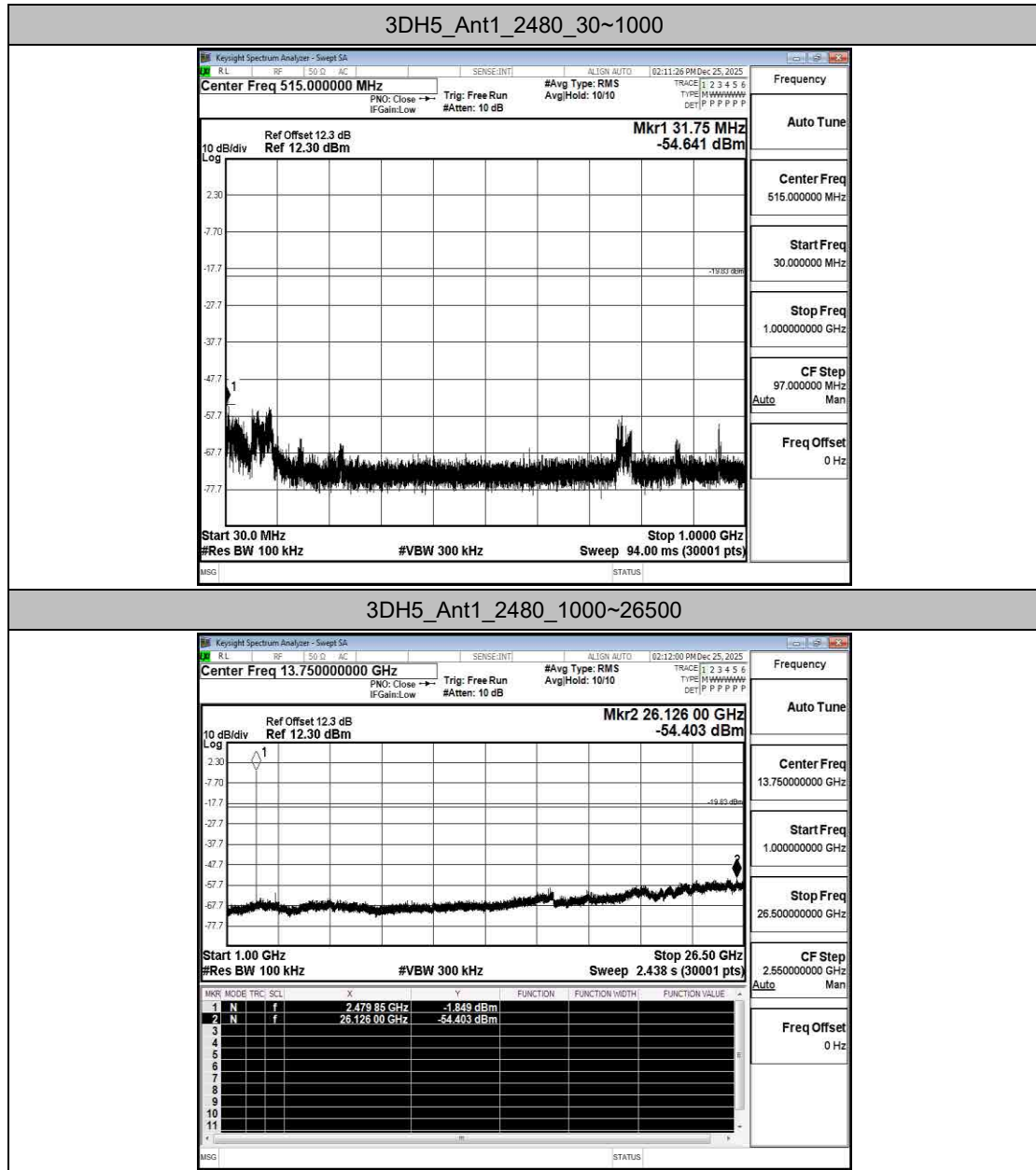




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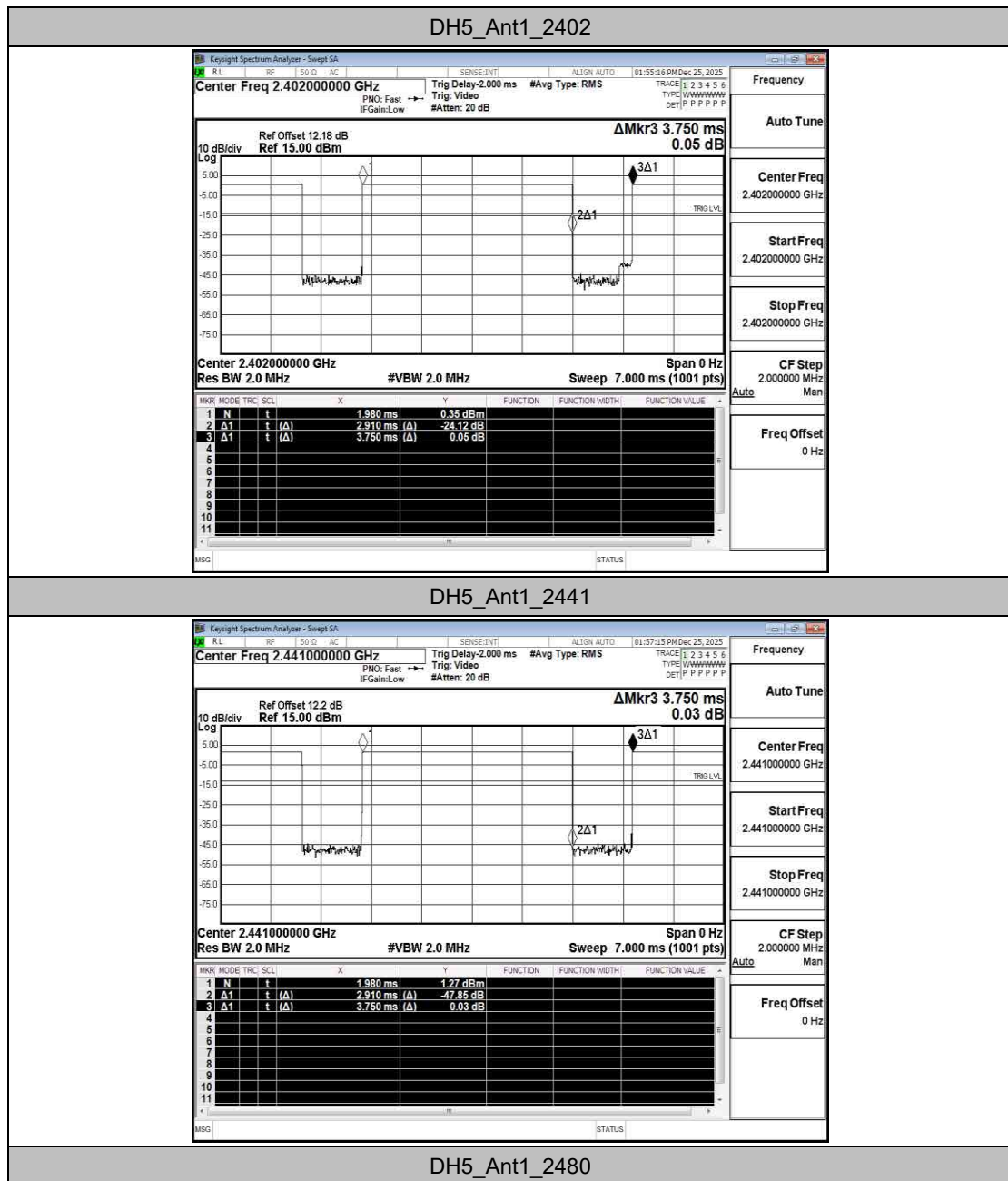


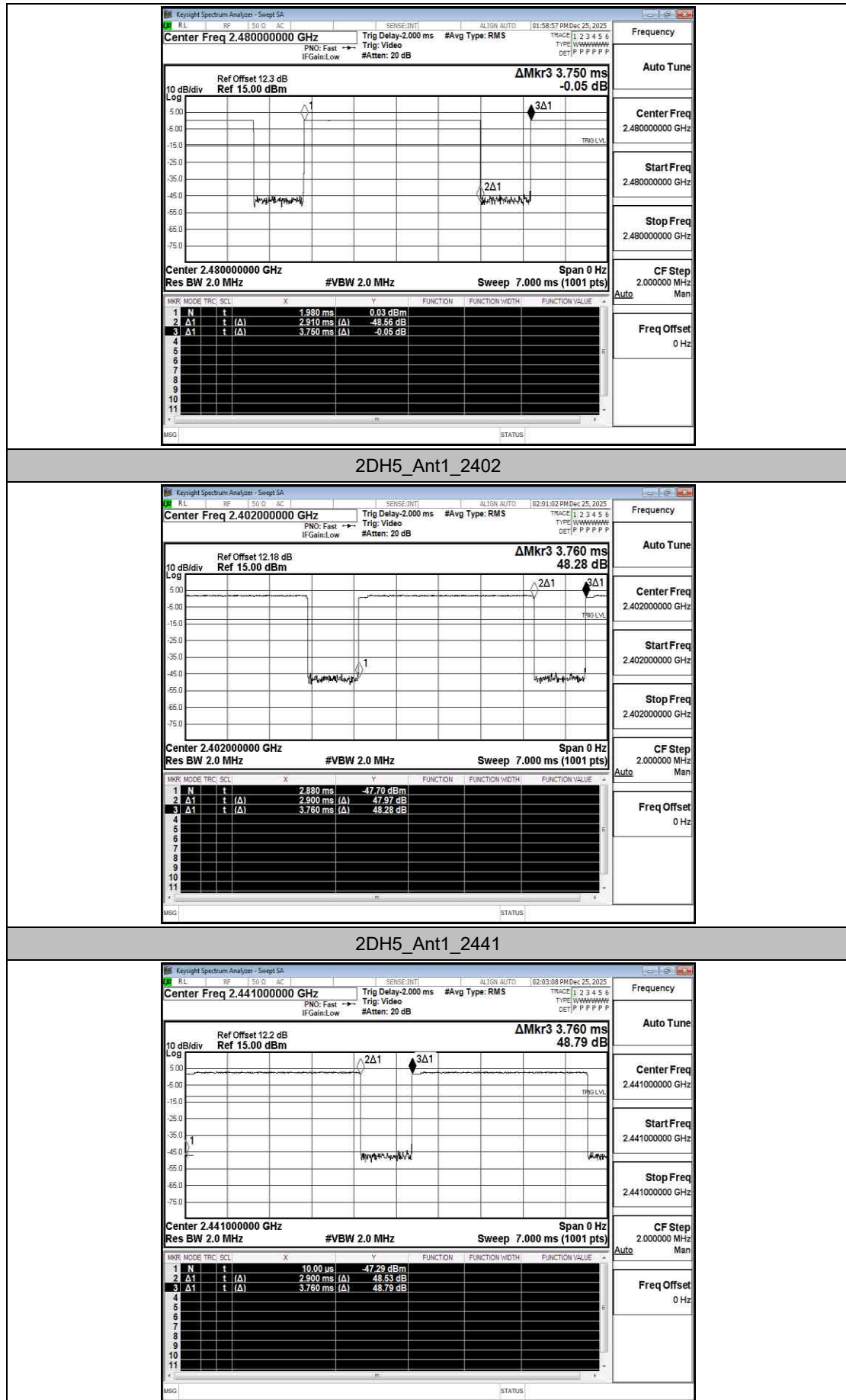
A.8 Duty Cycle

Test Result

TestMode	Antenna	Freq(MHz)	ON Time [ms]	Period [ms]	DC [%]	xFactor	Limit	Verdict
DH5	Ant1	2402	2.91	3.75	77.60	1.10	---	---
		2441	2.91	3.75	77.60	1.10	---	---
		2480	2.91	3.75	77.60	1.10	---	---
2DH5	Ant1	2402	2.90	3.76	77.13	1.13	---	---
		2441	2.90	3.76	77.13	1.13	---	---
		2480	2.89	3.74	77.27	1.12	---	---
3DH5	Ant1	2402	2.90	3.75	77.33	1.12	---	---
		2441	2.90	3.75	77.33	1.12	---	---
		2480	2.90	3.75	77.33	1.12	---	---

Test Graphs



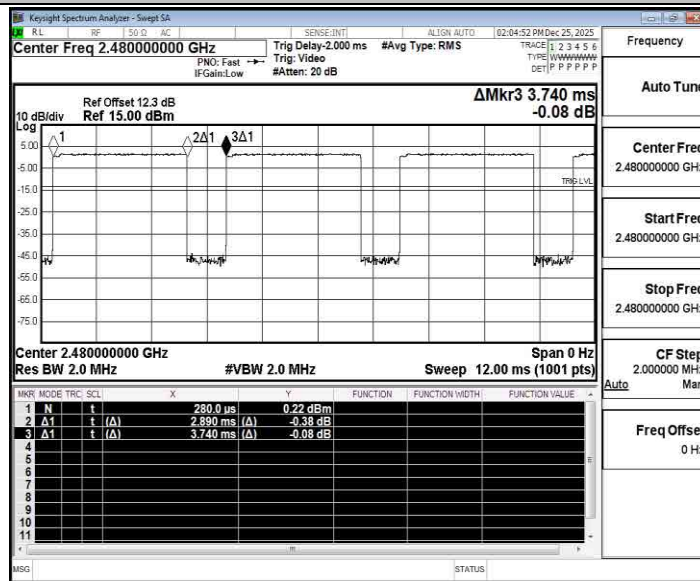


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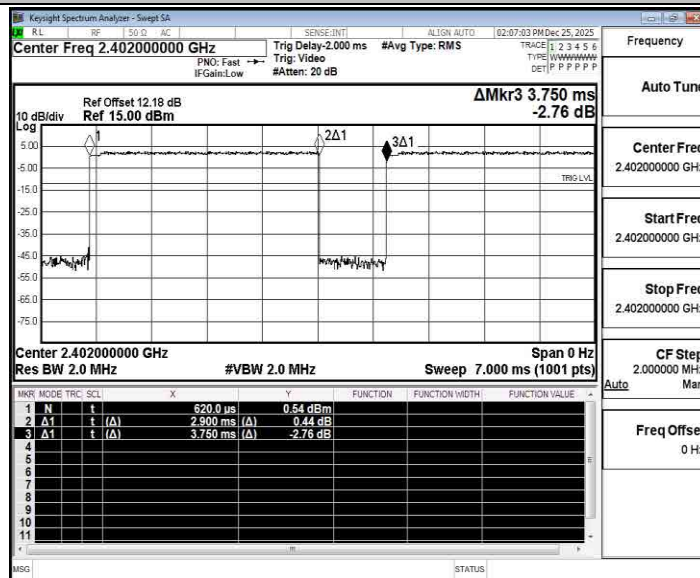
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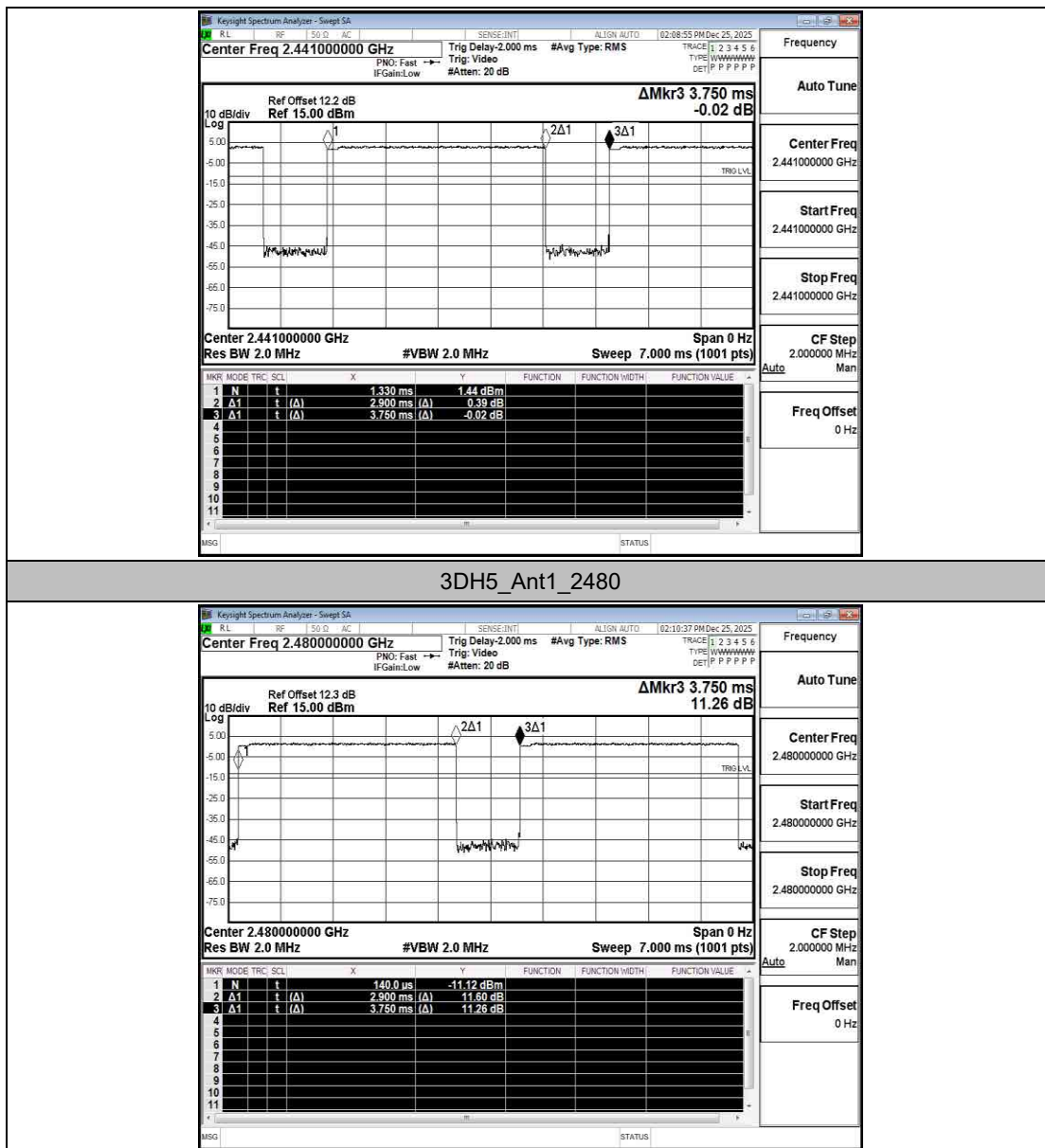
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



A.9 Emissions in Restricted Bands

Test Result

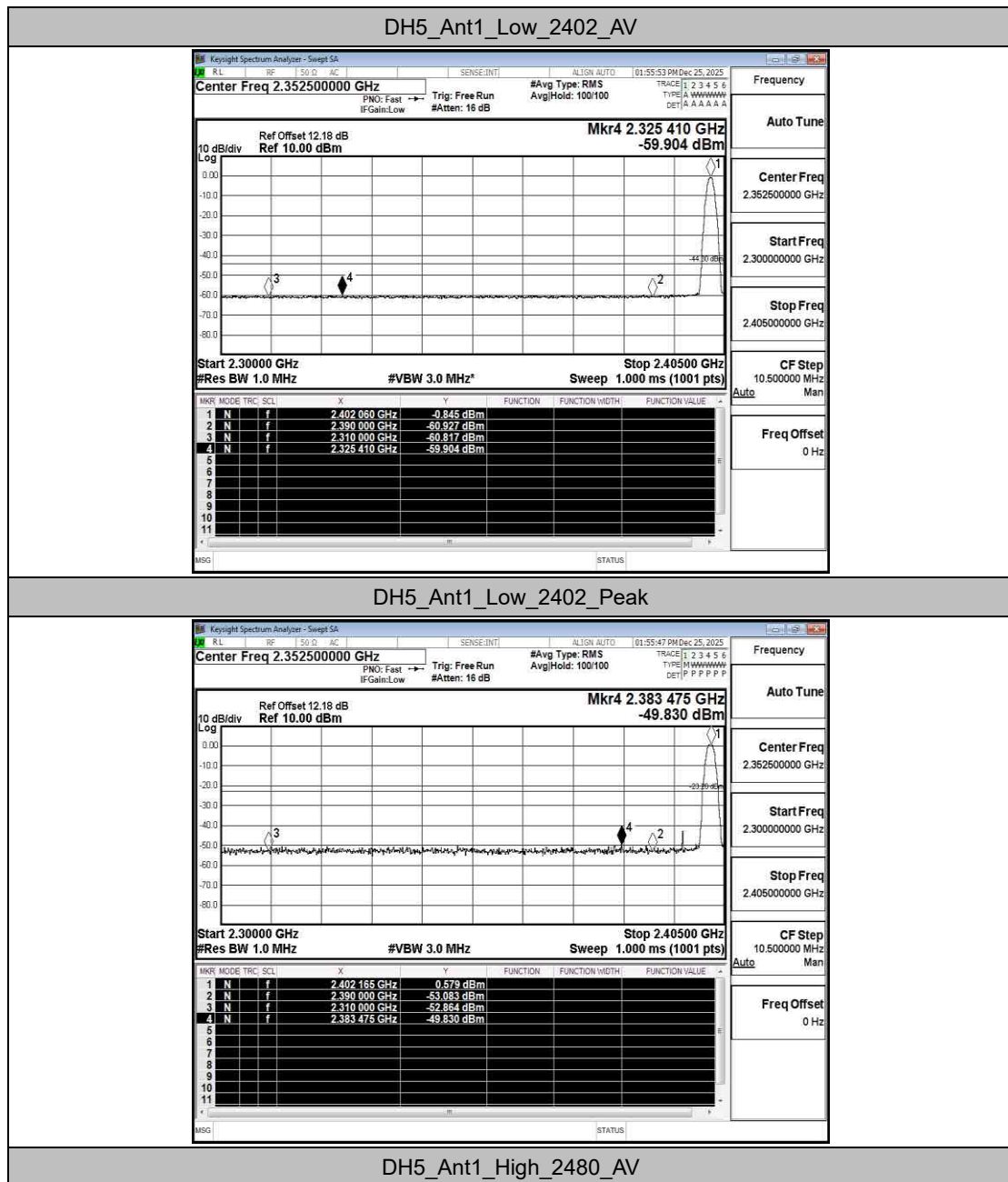
TestMode	Antenna	ChName	Freq (MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-60.82	≤-44.30	2.00	1.10	37.48	≤54	PASS
				AV	2325.410	-59.9	≤-44.30	2.00	1.10	38.40	≤54	PASS
				AV	2390.000	-60.93	≤-44.30	2.00	1.10	37.37	≤54	PASS
				Peak	2310.000	-52.86	≤-23.20	2.00	0.00	44.34	≤74	PASS
				Peak	2383.475	-49.83	≤-23.20	2.00	0.00	47.37	≤74	PASS
				Peak	2390.000	-53.08	≤-23.20	2.00	0.00	44.12	≤74	PASS
		High	2480	AV	2483.500	-60	≤-44.30	2.00	1.10	38.30	≤54	PASS
				AV	2486.000	-59.55	≤-44.30	2.00	1.10	38.75	≤54	PASS
				AV	2500.000	-61	≤-44.30	2.00	1.10	37.30	≤54	PASS
				Peak	2483.500	-51.21	≤-23.20	2.00	0.00	45.99	≤74	PASS
				Peak	2492.240	-49.51	≤-23.20	2.00	0.00	47.69	≤74	PASS
				Peak	2500.000	-52.73	≤-23.20	2.00	0.00	44.47	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-53.54	≤-23.20	2.00	0.00	43.66	≤74	PASS
				Peak	2381.060	-50.22	≤-23.20	2.00	0.00	46.98	≤74	PASS
				Peak	2390.000	-53.08	≤-23.20	2.00	0.00	44.12	≤74	PASS
		High	Hop_2480	Peak	2483.500	-51.97	≤-23.20	2.00	0.00	45.23	≤74	PASS
				Peak	2494.560	-49.52	≤-23.20	2.00	0.00	47.68	≤74	PASS
				Peak	2500.000	-52.25	≤-23.20	2.00	0.00	44.95	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-60.78	≤-44.33	2.00	1.13	37.55	≤54	PASS
				AV	2331.710	-60.19	≤-44.33	2.00	1.13	38.14	≤54	PASS
				AV	2390.000	-61.38	≤-44.33	2.00	1.13	36.95	≤54	PASS
				Peak	2310.000	-53.4	≤-23.20	2.00	0.00	43.80	≤74	PASS
				Peak	2356.385	-50.27	≤-23.20	2.00	0.00	46.93	≤74	PASS
				Peak	2390.000	-53.48	≤-23.20	2.00	0.00	43.72	≤74	PASS
		High	2480	AV	2483.500	-58.58	≤-44.32	2.00	1.12	39.74	≤54	PASS
				AV	2483.680	-58.25	≤-44.32	2.00	1.12	40.07	≤54	PASS
				AV	2500.000	-60.66	≤-44.32	2.00	1.12	37.66	≤54	PASS
				Peak	2483.500	-48.1	≤-23.20	2.00	0.00	49.10	≤74	PASS
				Peak	2483.760	-46.98	≤-23.20	2.00	0.00	50.22	≤74	PASS
				Peak	2500.000	-53.25	≤-23.20	2.00	0.00	43.95	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-53.37	≤-23.20	2.00	0.00	43.83	≤74	PASS
				Peak	2349.035	-49.58	≤-23.20	2.00	0.00	47.62	≤74	PASS
				Peak	2390.000	-52.77	≤-23.20	2.00	0.00	44.43	≤74	PASS
		High	Hop_2480	Peak	2483.500	-50.11	≤-23.20	2.00	0.00	47.09	≤74	PASS
				Peak	2500.000	-53.27	≤-23.20	2.00	0.00	43.93	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-61.37	≤-44.32	2.00	1.12	36.95	≤54	PASS

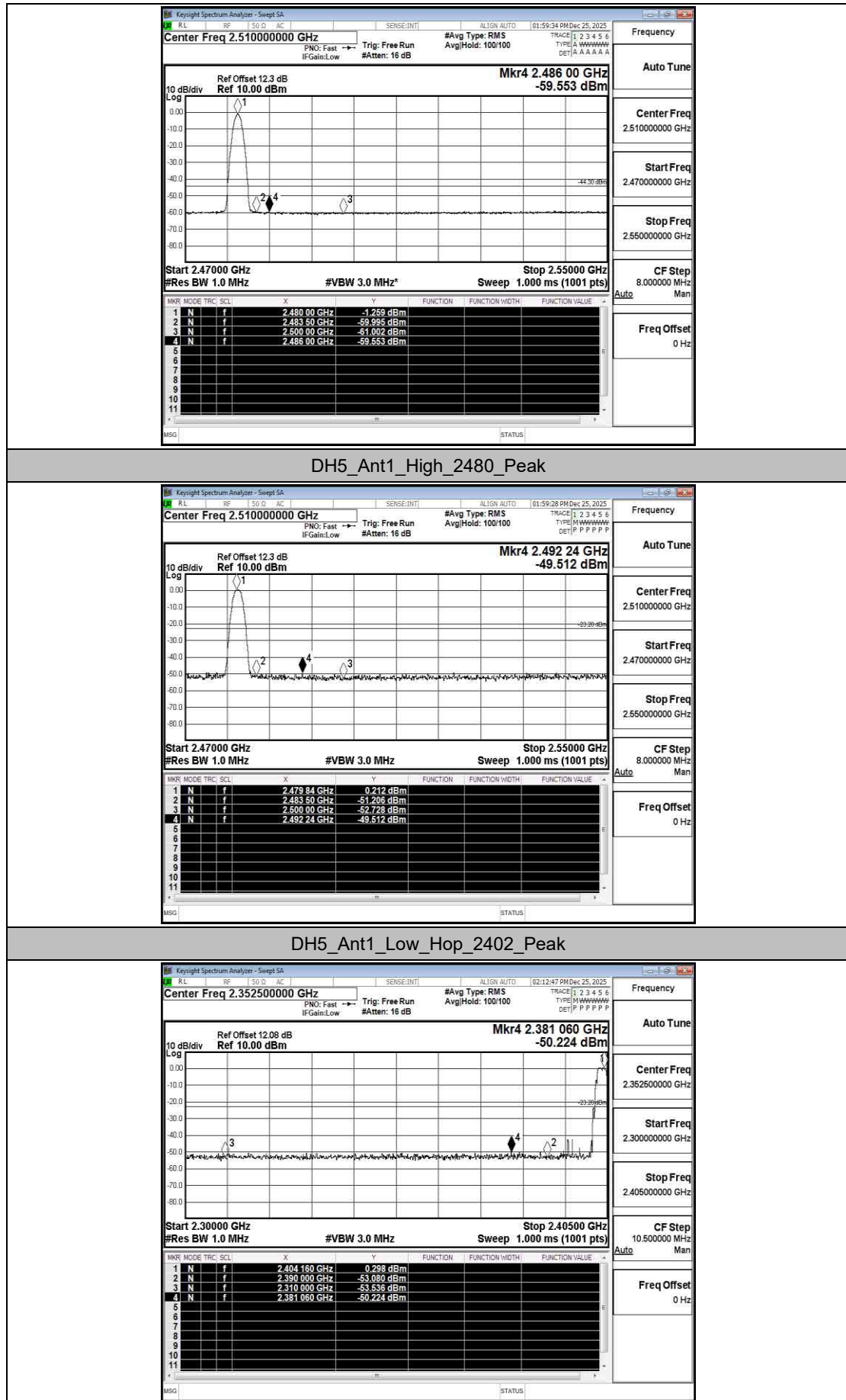
				AV	2335.805	-60.27	≤-44.32	2.00	1.12	38.05	≤54	PASS
				AV	2390.000	-60.76	≤-44.32	2.00	1.12	37.56	≤54	PASS
				Peak	2310.000	-52.69	≤-23.20	2.00	0.00	44.51	≤74	PASS
				Peak	2367.935	-49.64	≤-23.20	2.00	0.00	47.56	≤74	PASS
				Peak	2390.000	-52.63	≤-23.20	2.00	0.00	44.57	≤74	PASS
		High	2480	AV	2483.500	-57.58	≤-44.32	2.00	1.12	40.74	≤54	PASS
				AV	2483.600	-57.46	≤-44.32	2.00	1.12	40.86	≤54	PASS
				AV	2500.000	-60.35	≤-44.32	2.00	1.12	37.97	≤54	PASS
				Peak	2483.500	-48.67	≤-23.20	2.00	0.00	48.53	≤74	PASS
				Peak	2484.800	-46.58	≤-23.20	2.00	0.00	50.62	≤74	PASS
				Peak	2500.000	-52	≤-23.20	2.00	0.00	45.20	≤74	PASS
		Low	Hop_2402	Peak	2310.000	-52.41	≤-23.20	2.00	0.00	44.79	≤74	PASS
				Peak	2316.275	-49.94	≤-23.20	2.00	0.00	47.26	≤74	PASS
				Peak	2390.000	-52.25	≤-23.20	2.00	0.00	44.95	≤74	PASS
		High	Hop_2480	Peak	2483.500	-52.84	≤-23.20	2.00	0.00	44.36	≤74	PASS
				Peak	2494.800	-49.36	≤-23.20	2.00	0.00	47.84	≤74	PASS
				Peak	2500.000	-50.27	≤-23.20	2.00	0.00	46.93	≤74	PASS

Note:

1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs



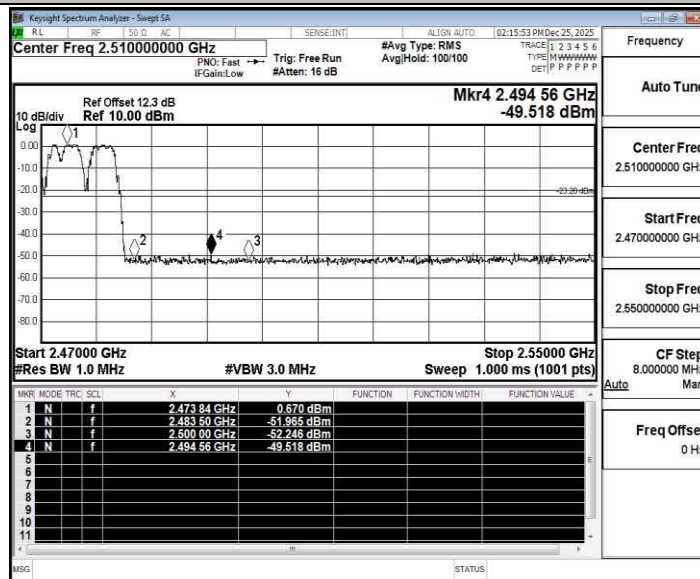


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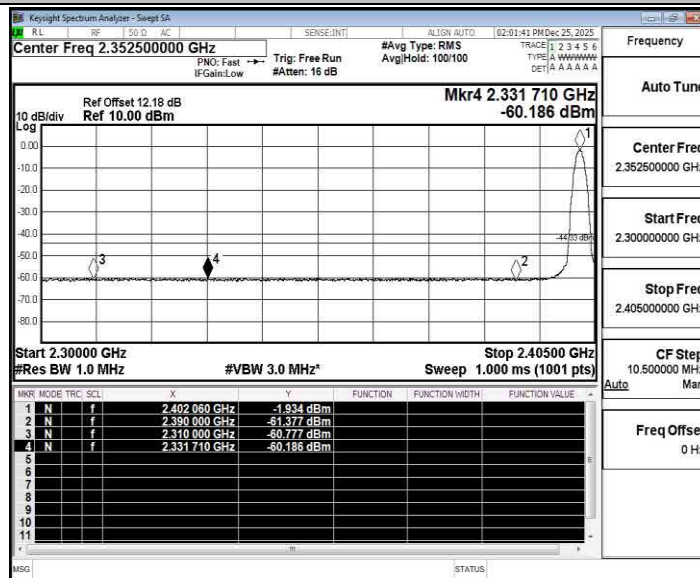
Add: No.44-1, Qianfeng North Road, Shiqi, Panyu District, Guangzhou, Guangdong, China

Tel: +(86) 020-39166689 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

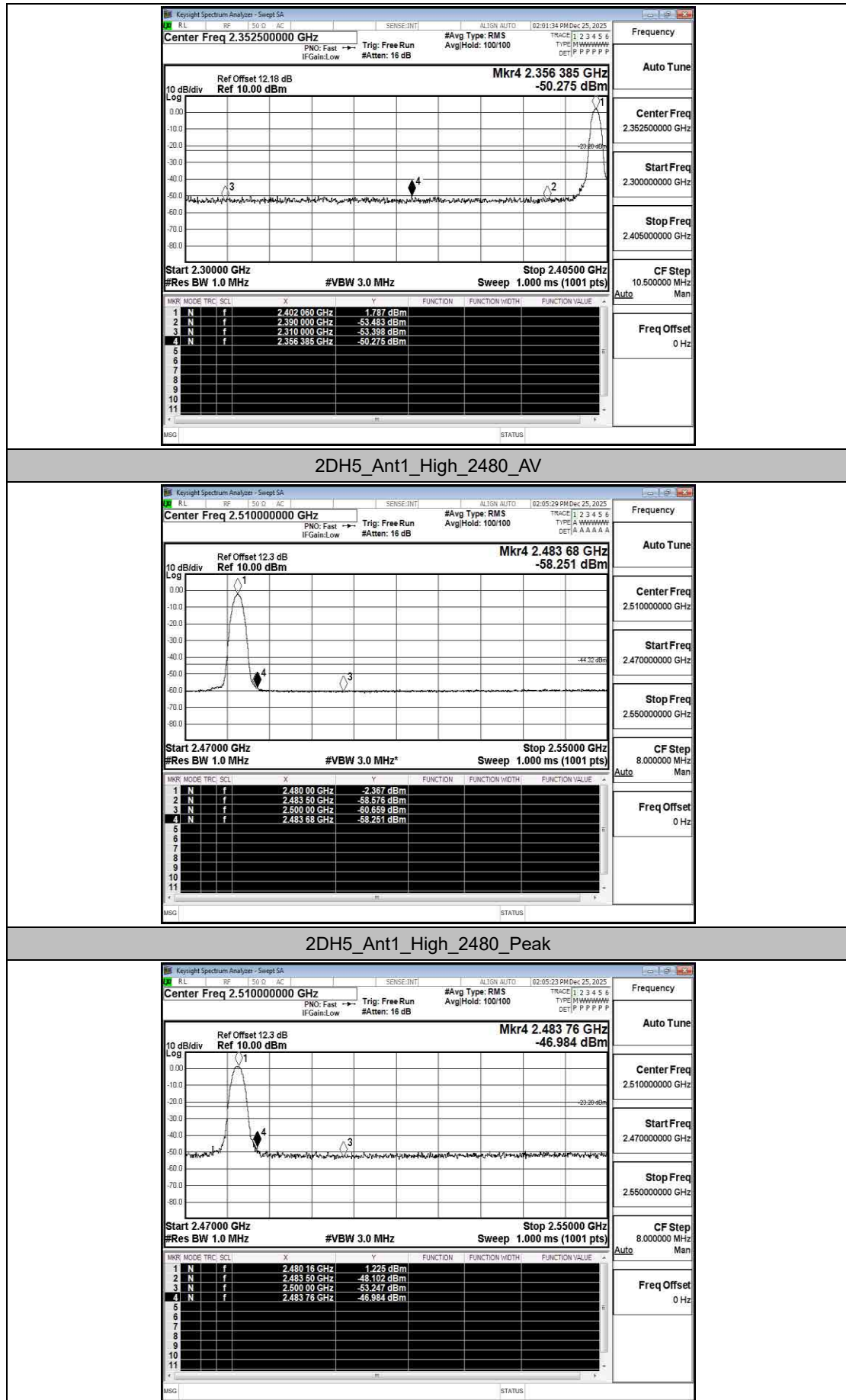
DH5_Ant1_High_Hop_2480_Peak



2DH5_Ant1_Low_2402_AV



2DH5_Ant1_Low_2402_Peak

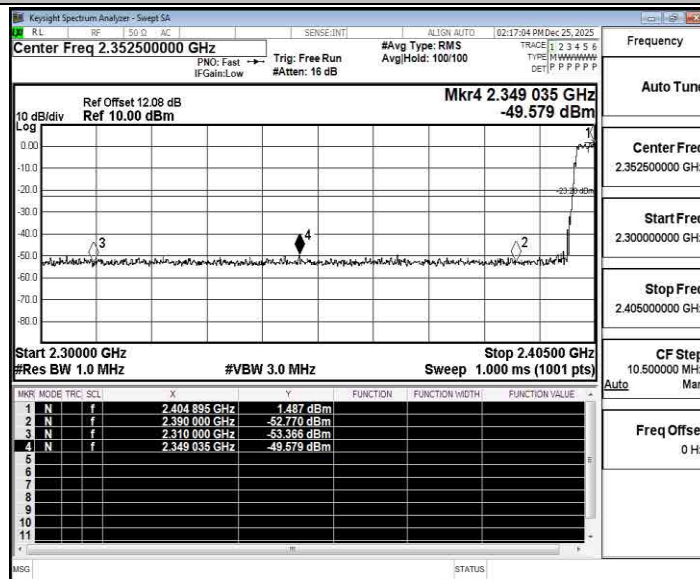


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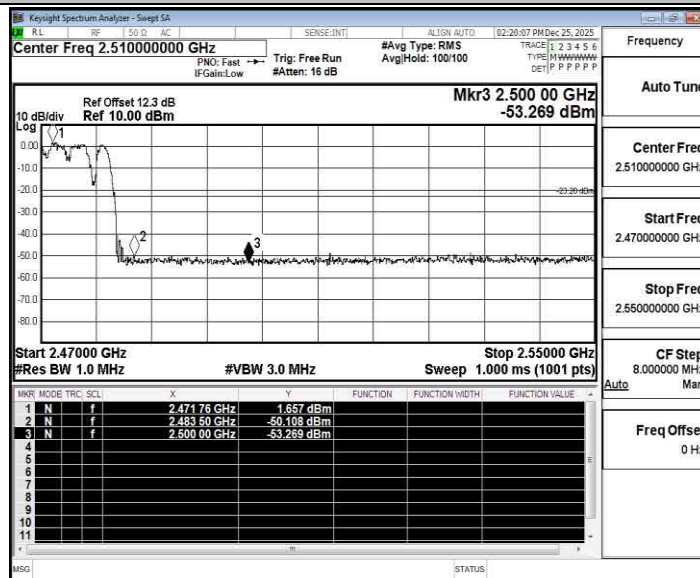
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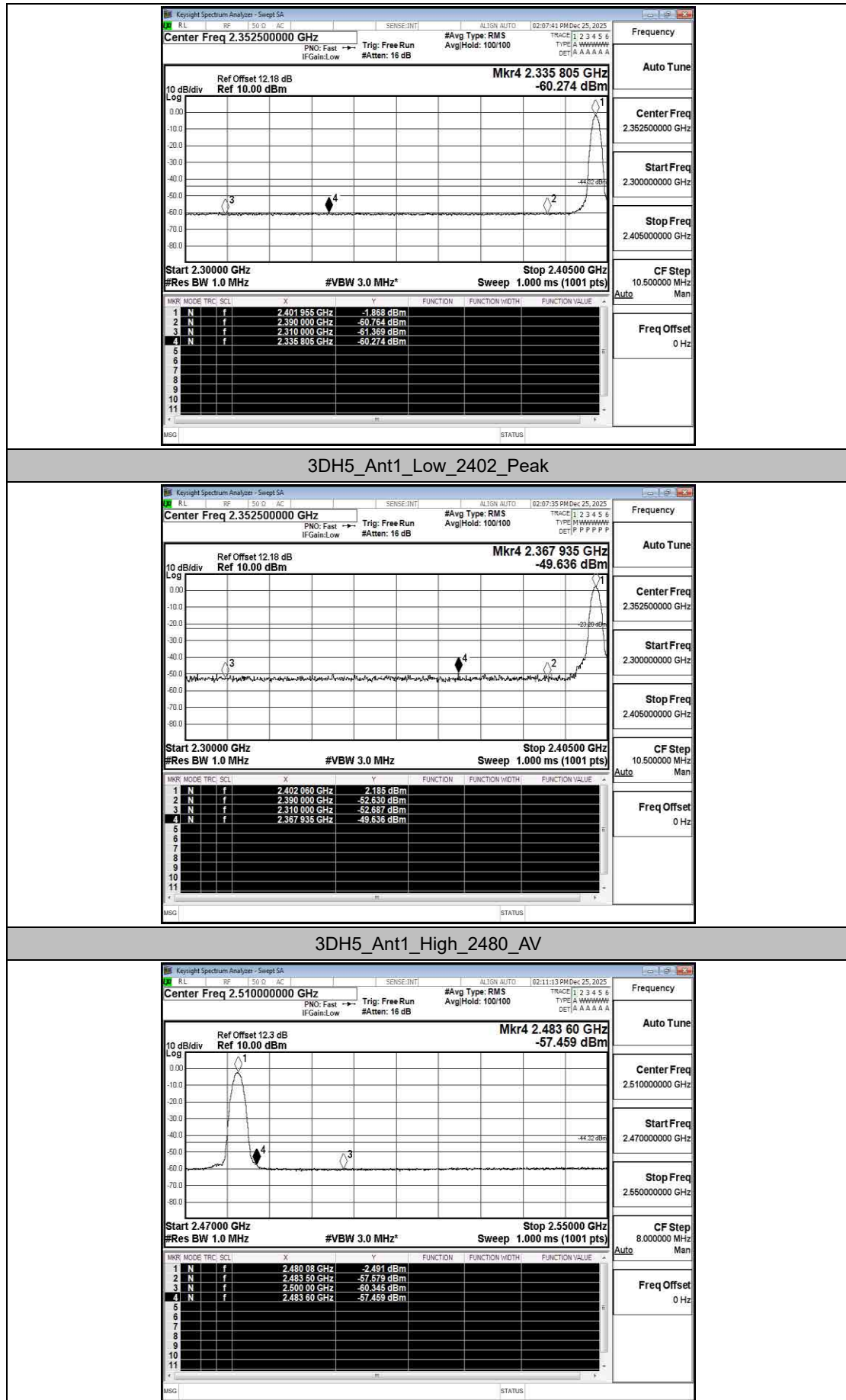
2DH5_Ant1_Low_Hop_2402_Peak



2DH5_Ant1_High_Hop_2480_Peak



3DH5_Ant1_Low_2402_AV

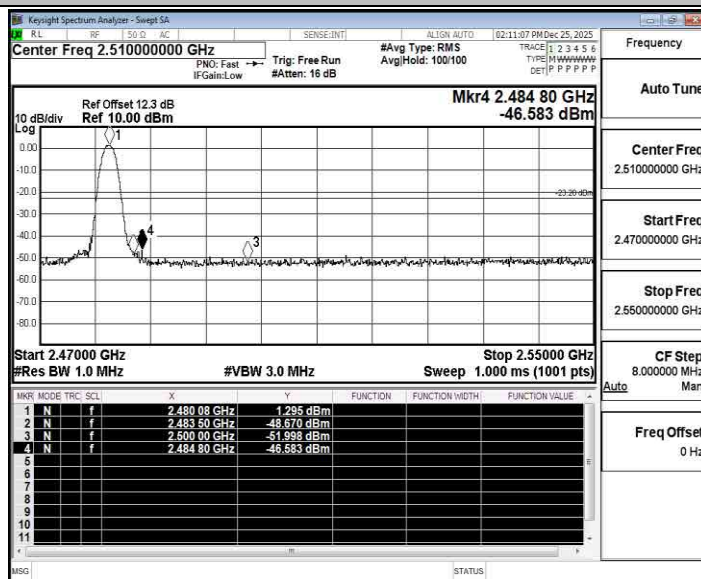


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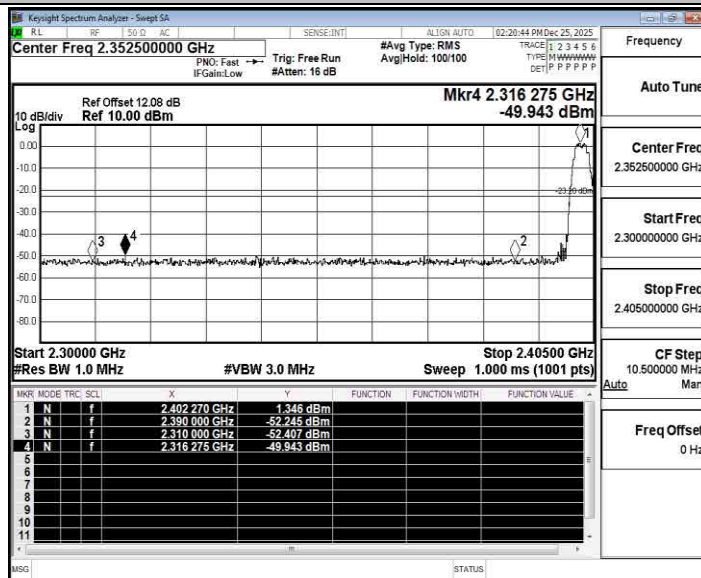
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3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

