



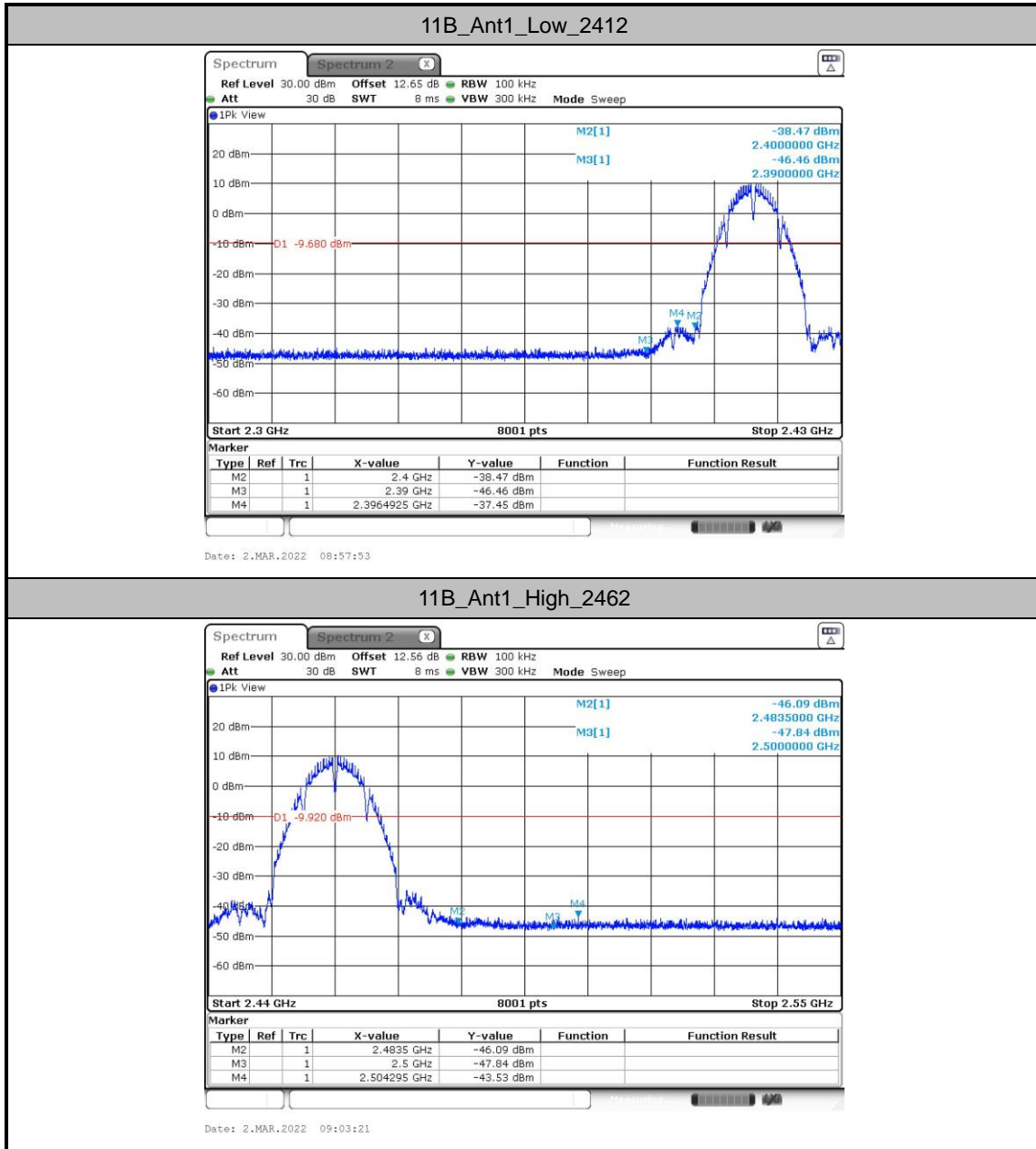
Band edge measurements

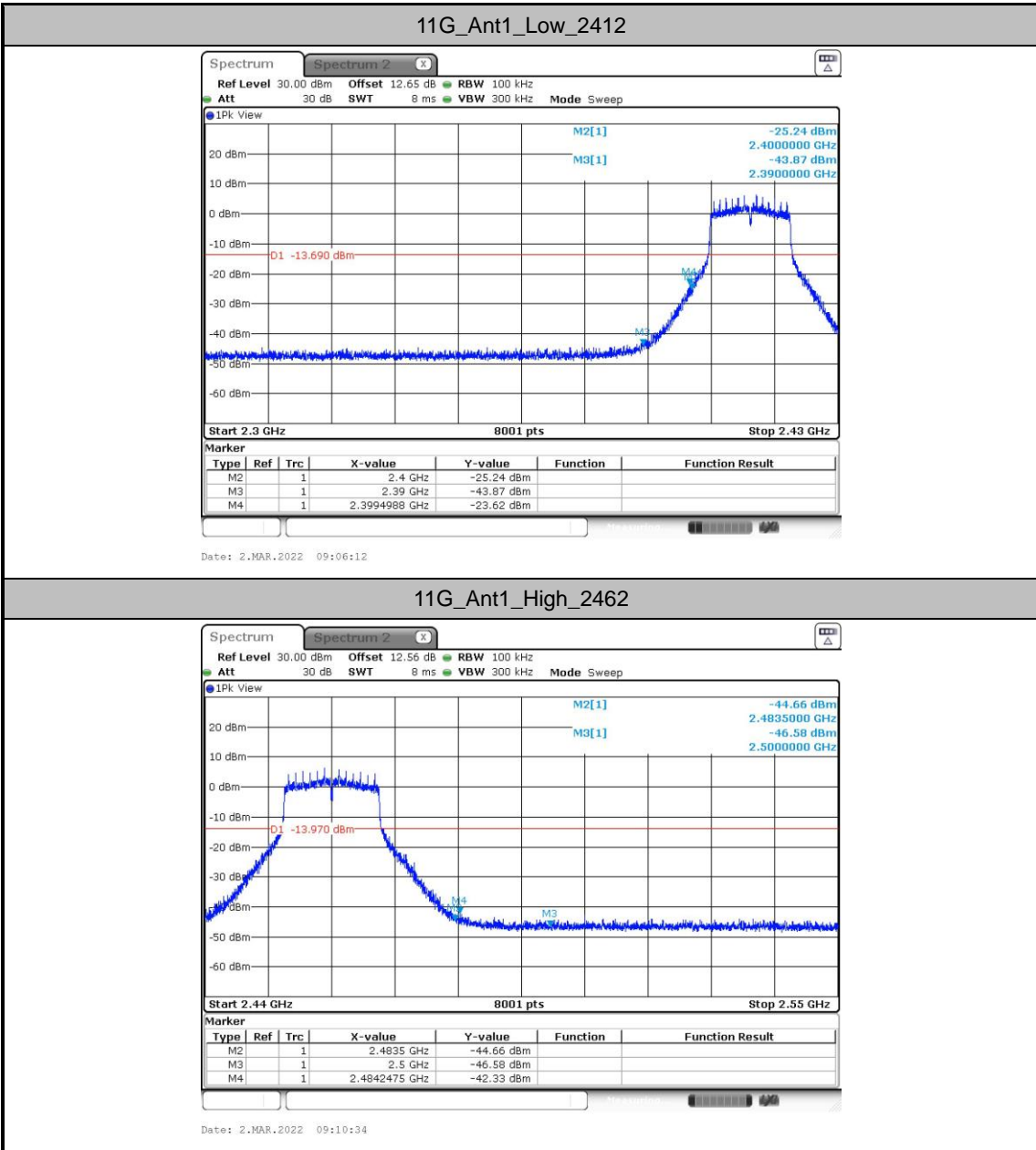
Test Result

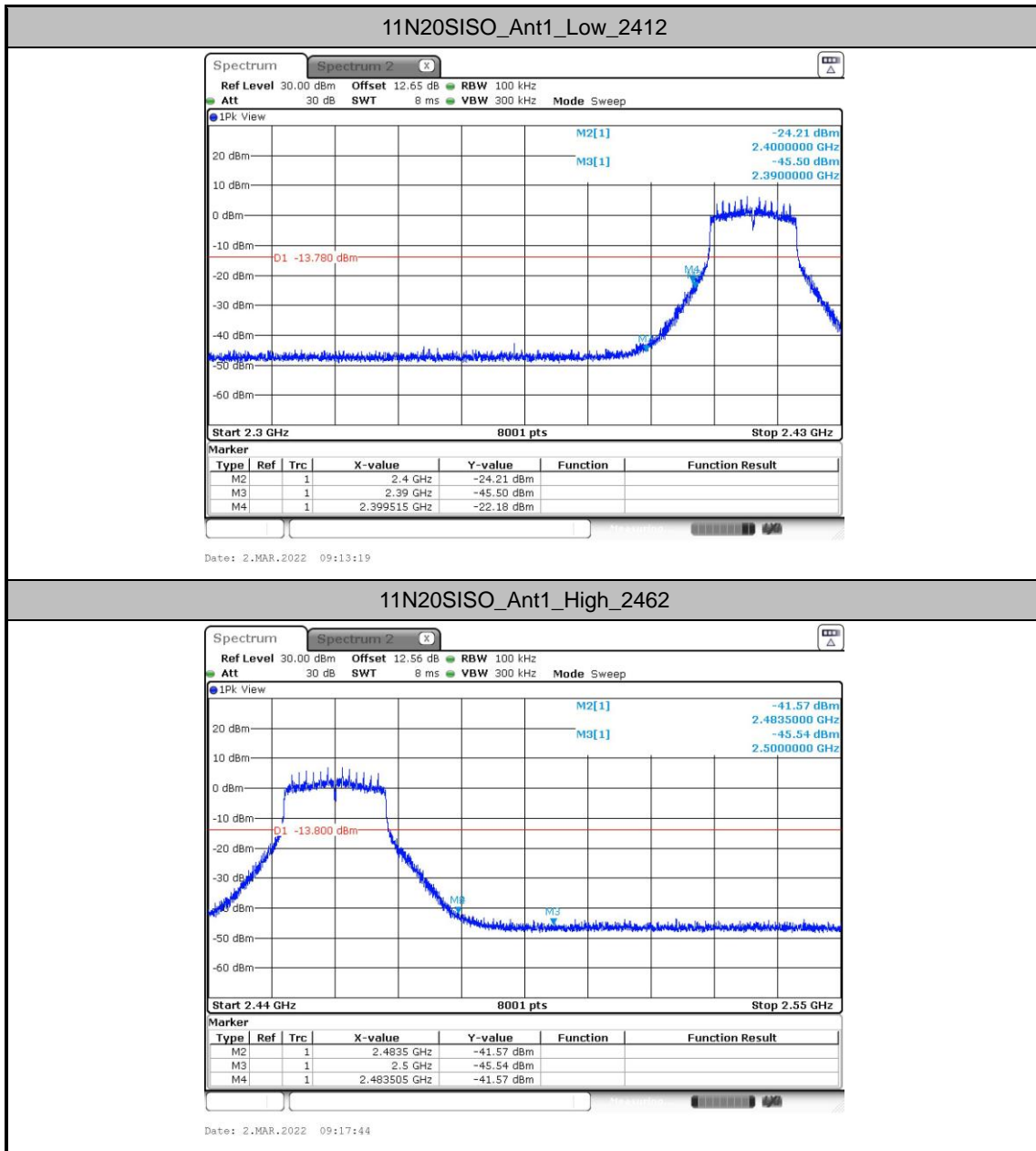
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	10.32	-37.45	≤-9.68	PASS
		High	2462	10.08	-43.53	≤-9.92	PASS
11G	Ant1	Low	2412	6.31	-23.62	≤-13.69	PASS
		High	2462	6.03	-42.33	≤-13.97	PASS
11N20SISO	Ant1	Low	2412	6.22	-22.18	≤-13.78	PASS
		High	2462	6.20	-41.57	≤-13.8	PASS
11N40SISO	Ant1	Low	2422	1.94	-33.03	≤-18.06	PASS
		High	2452	2.34	-39.49	≤-17.66	PASS

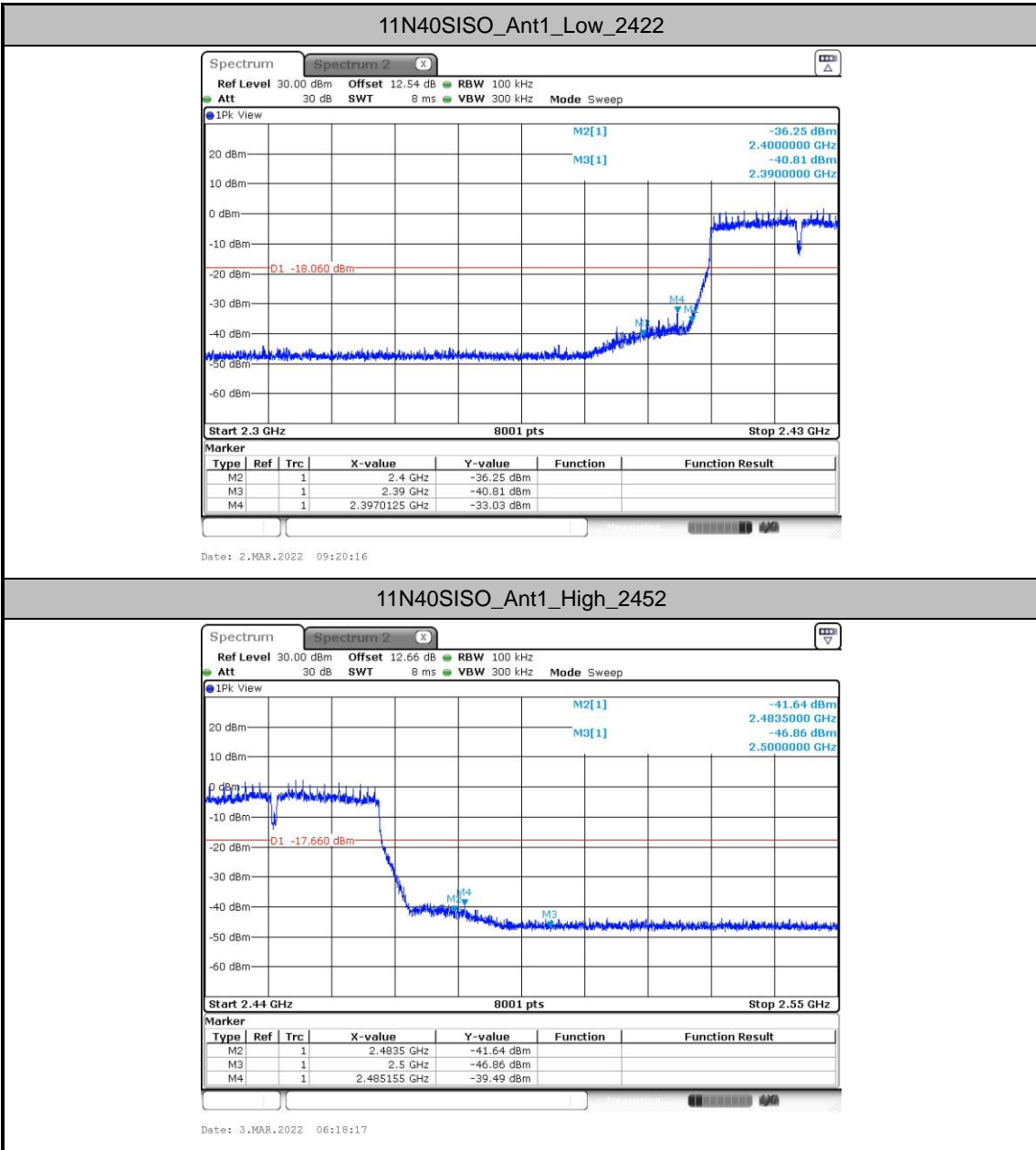


Test Graphs











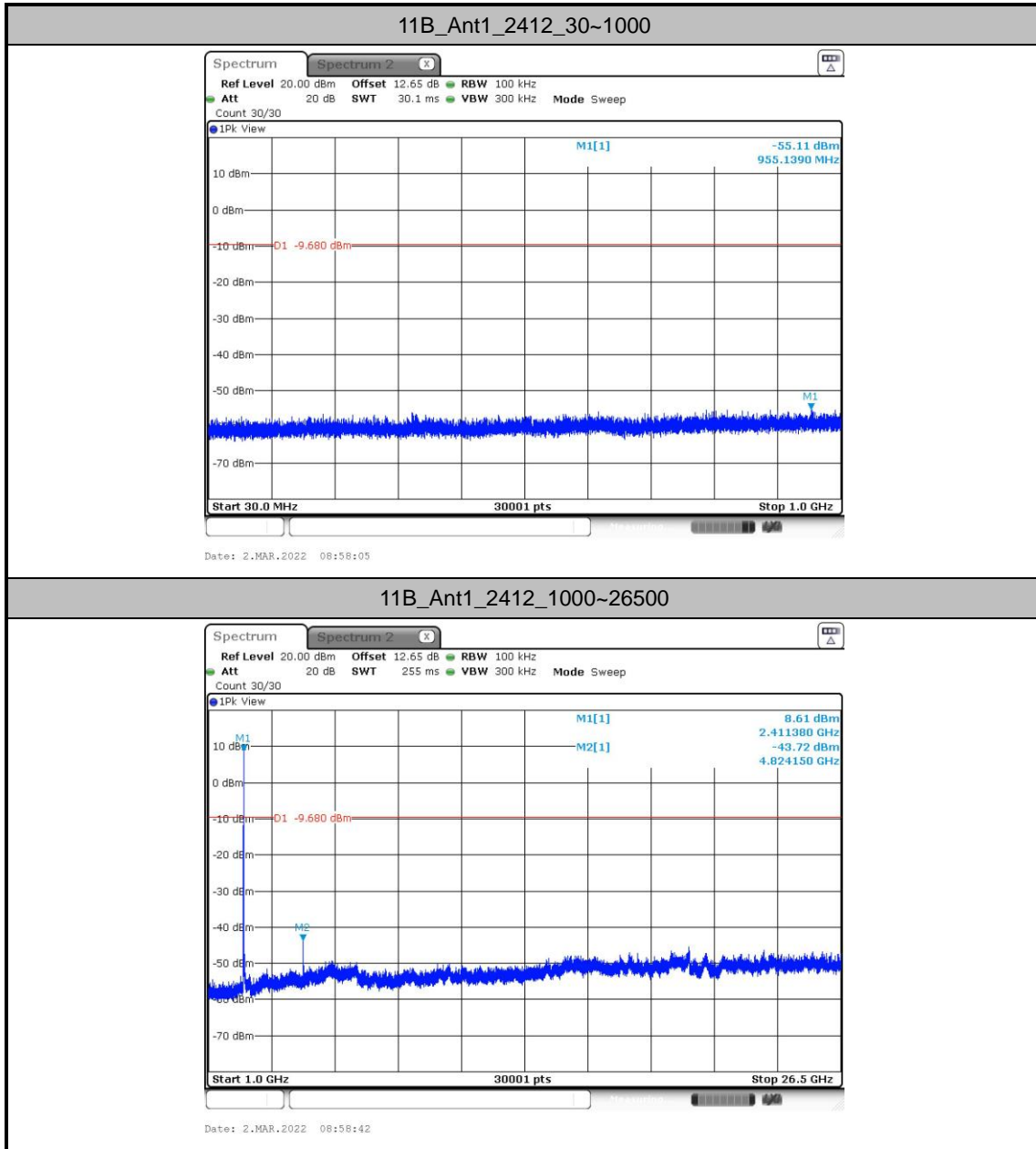
Conducted Spurious Emission

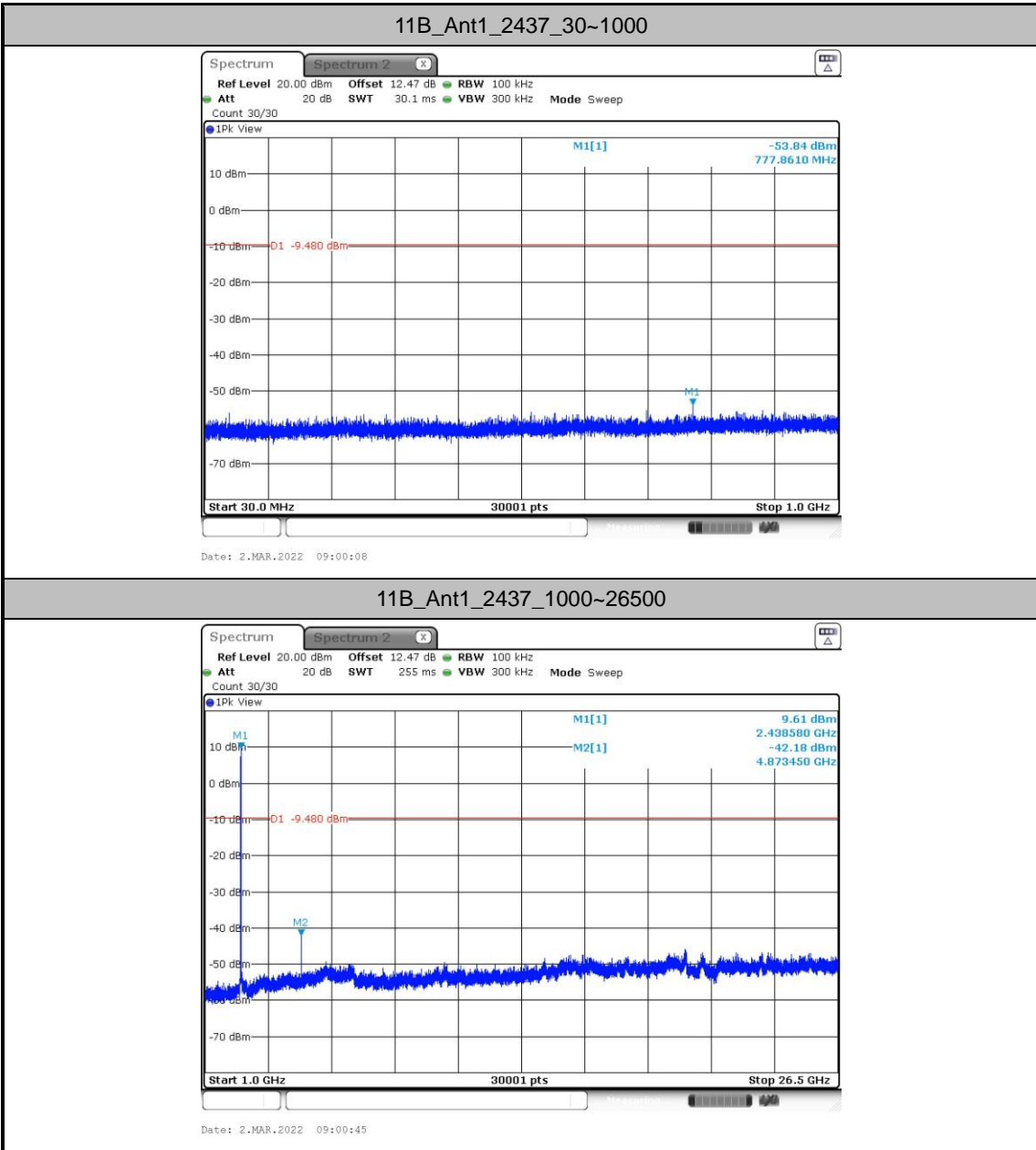
Test Result

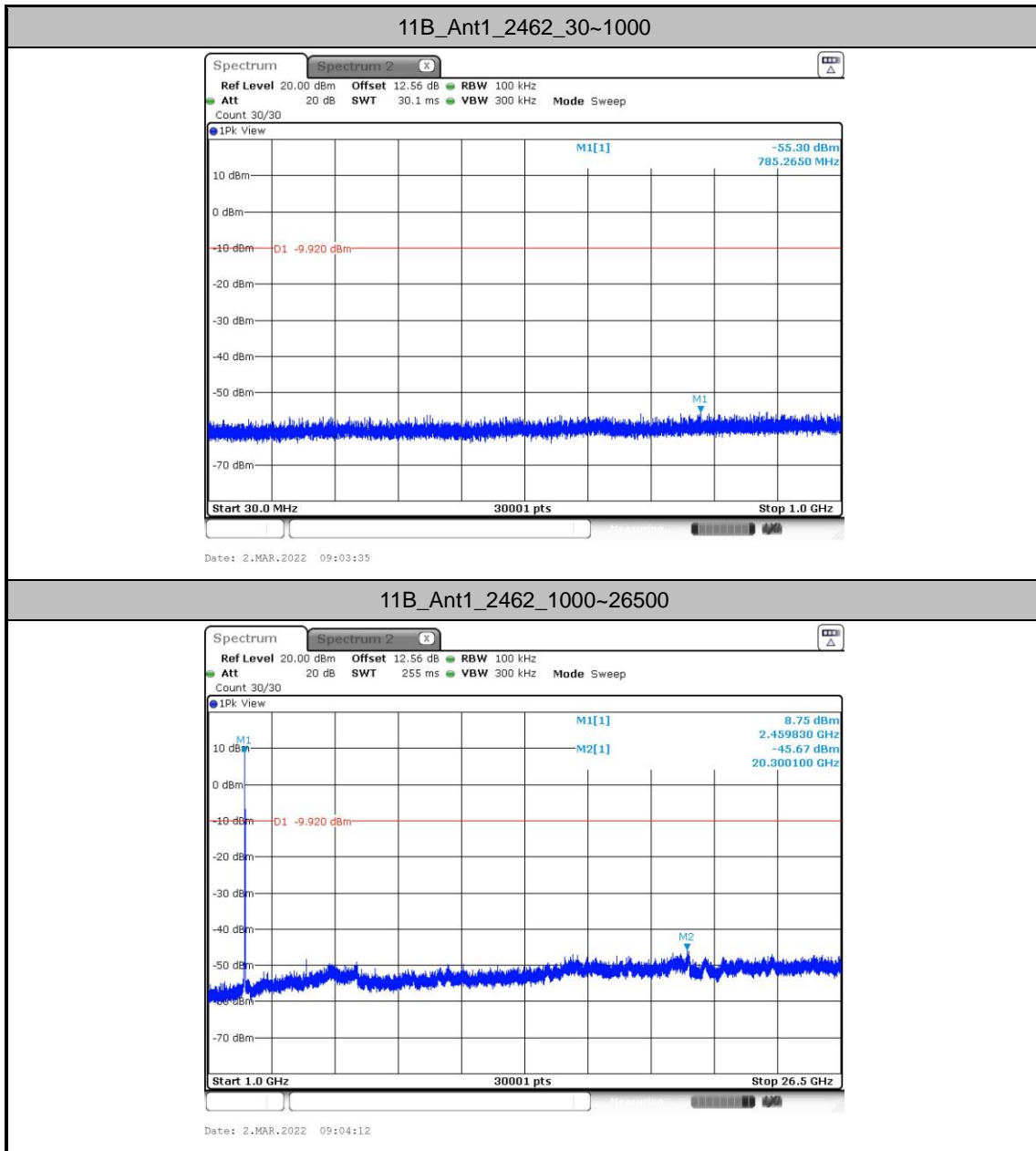
TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	30~1000	10.32	-55.11	≤-9.68	PASS
			1000~26500	10.32	-43.72	≤-9.68	PASS
		2437	30~1000	10.52	-53.84	≤-9.48	PASS
			1000~26500	10.52	-42.18	≤-9.48	PASS
		2462	30~1000	10.08	-55.3	≤-9.92	PASS
			1000~26500	10.08	-45.67	≤-9.92	PASS
11G	Ant1	2412	30~1000	6.31	-55.35	≤-13.69	PASS
			1000~26500	6.31	-46.28	≤-13.69	PASS
		2437	30~1000	6.16	-54.97	≤-13.84	PASS
			1000~26500	6.16	-46.01	≤-13.84	PASS
		2462	30~1000	6.03	-55.08	≤-13.97	PASS
			1000~26500	6.03	-46.22	≤-13.97	PASS
11N20SISO	Ant1	2412	30~1000	6.22	-54.49	≤-13.78	PASS
			1000~26500	6.22	-45.28	≤-13.78	PASS
		2437	30~1000	6.68	-55.2	≤-13.32	PASS
			1000~26500	6.68	-46.51	≤-13.32	PASS
		2462	30~1000	6.20	-49.74	≤-13.8	PASS
			1000~26500	6.20	-46.32	≤-13.8	PASS
11N40SISO	Ant1	2422	30~1000	1.94	-55.08	≤-18.06	PASS
			1000~26500	1.94	-46.04	≤-18.06	PASS
		2437	30~1000	2.32	-54.71	≤-17.68	PASS
			1000~26500	2.32	-46.12	≤-17.68	PASS
		2452	30~1000	2.34	-54.93	≤-17.66	PASS
			1000~26500	2.34	-45.58	≤-17.66	PASS

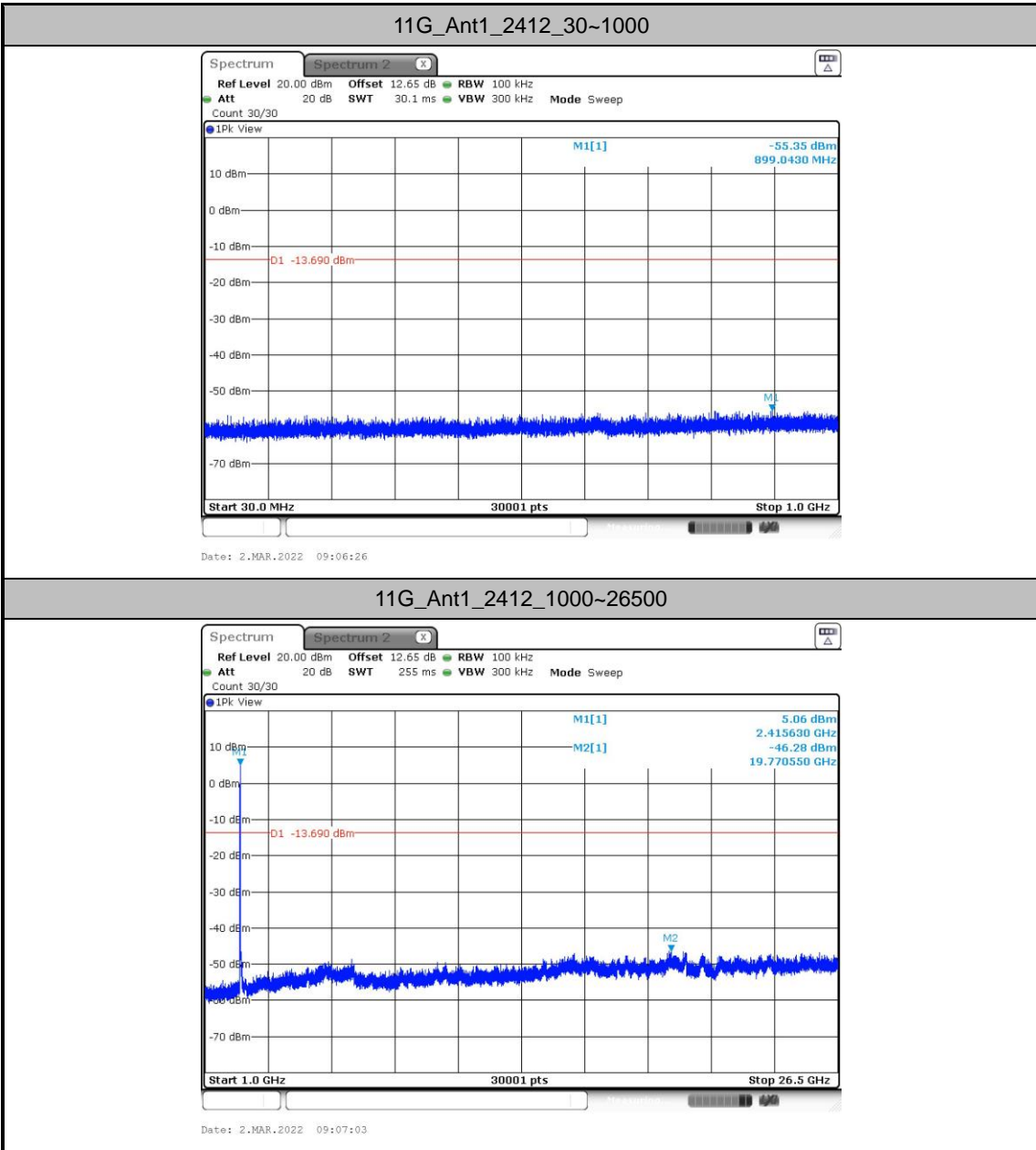


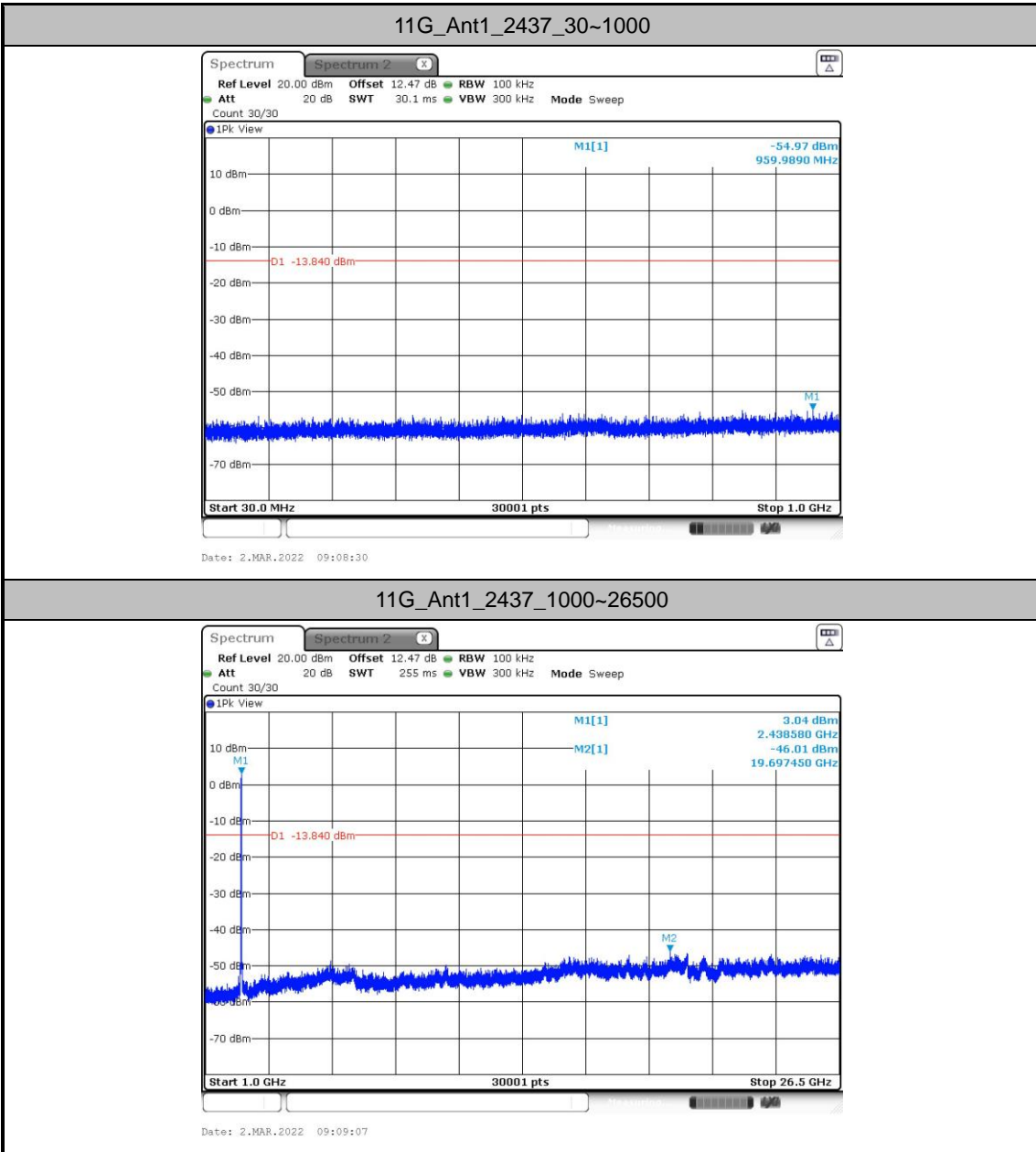
Test Graphs

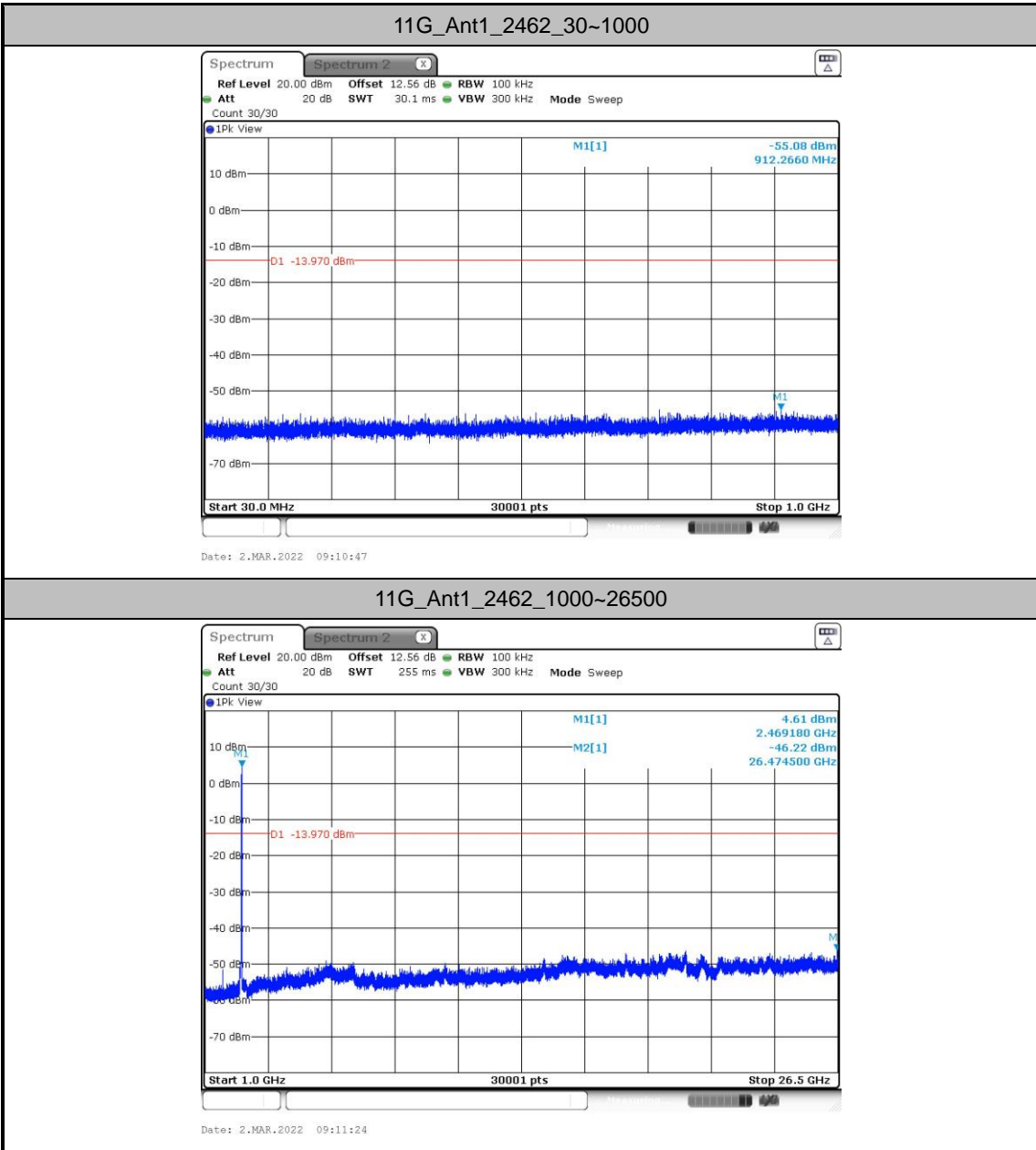


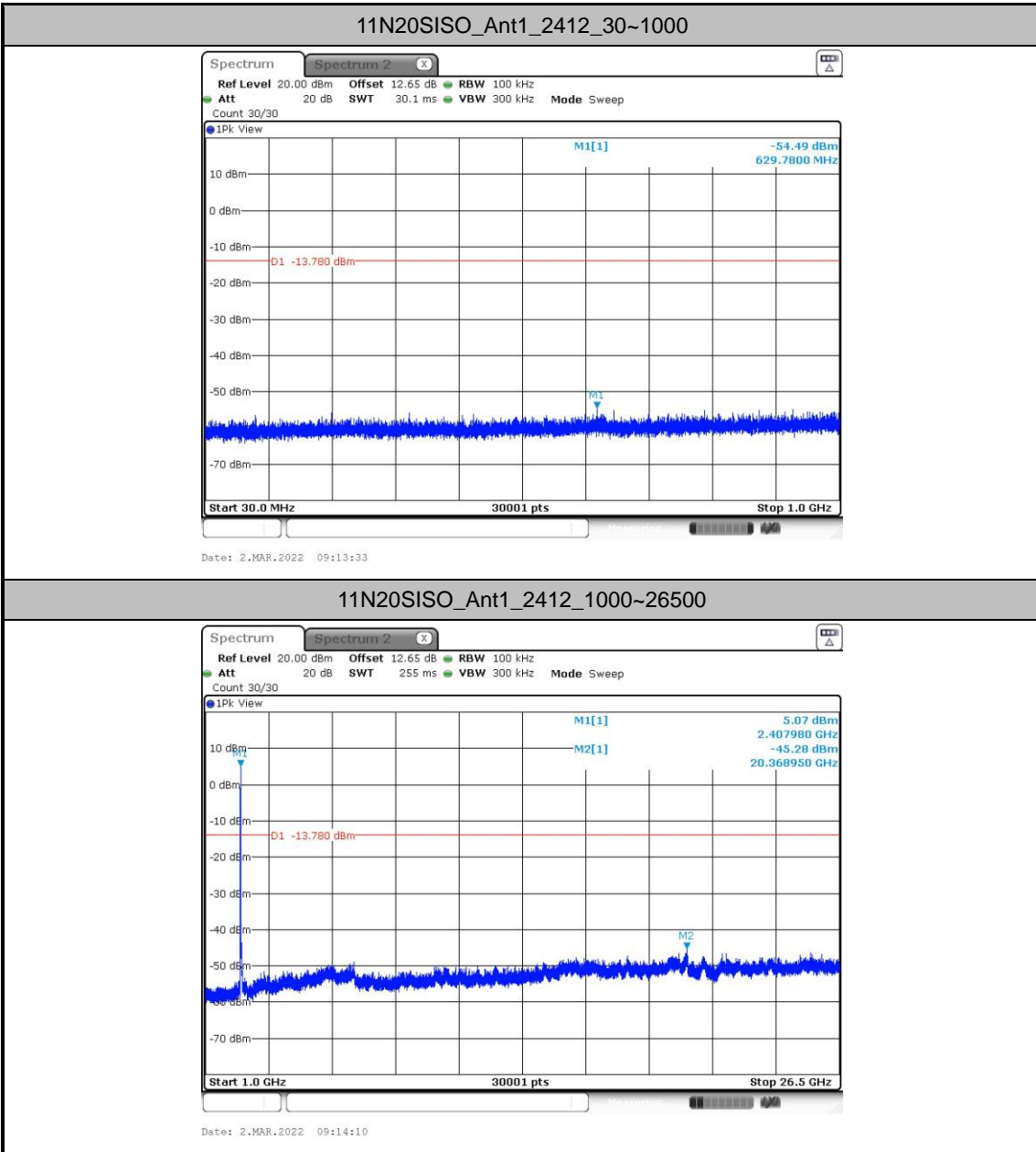


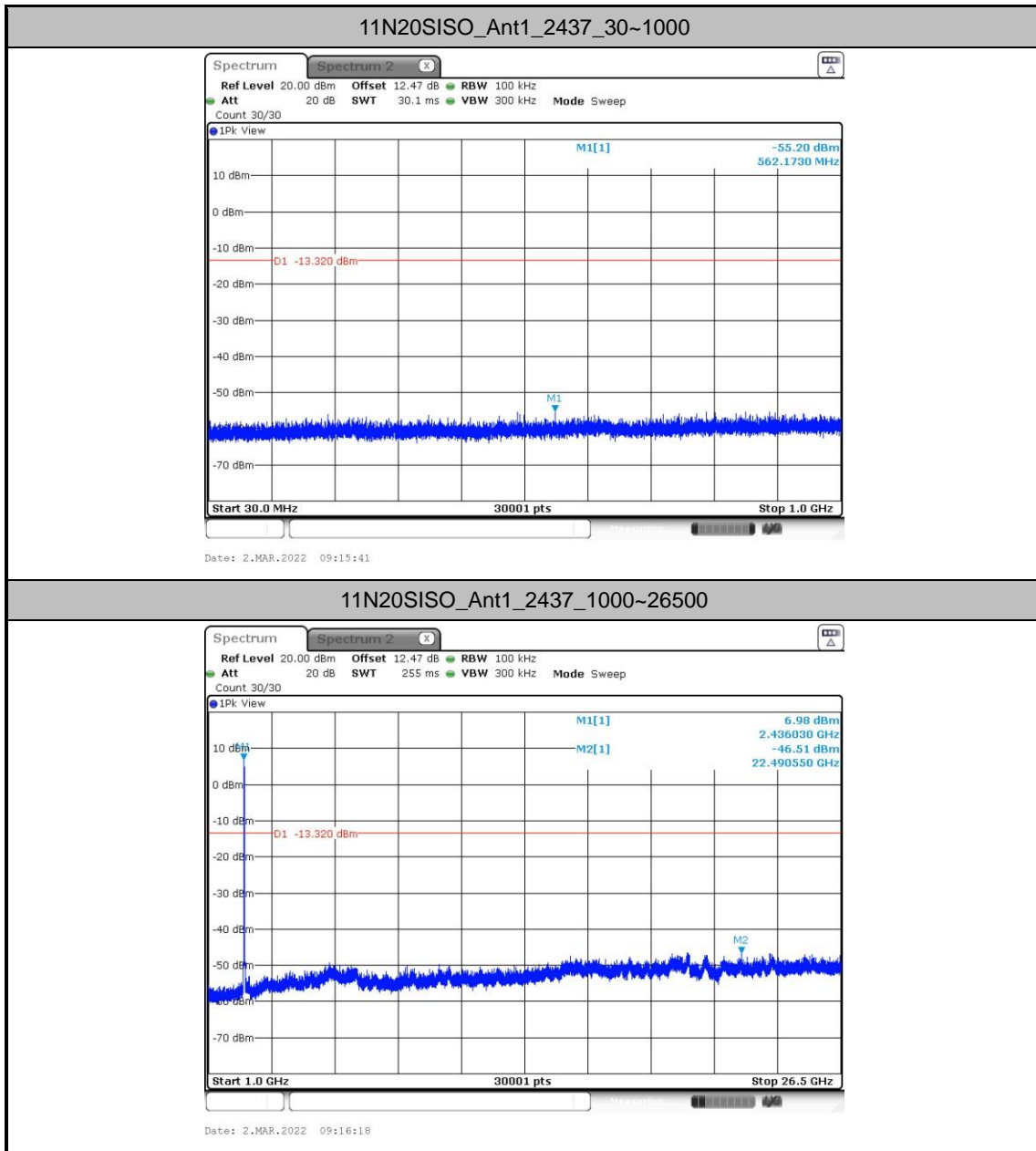


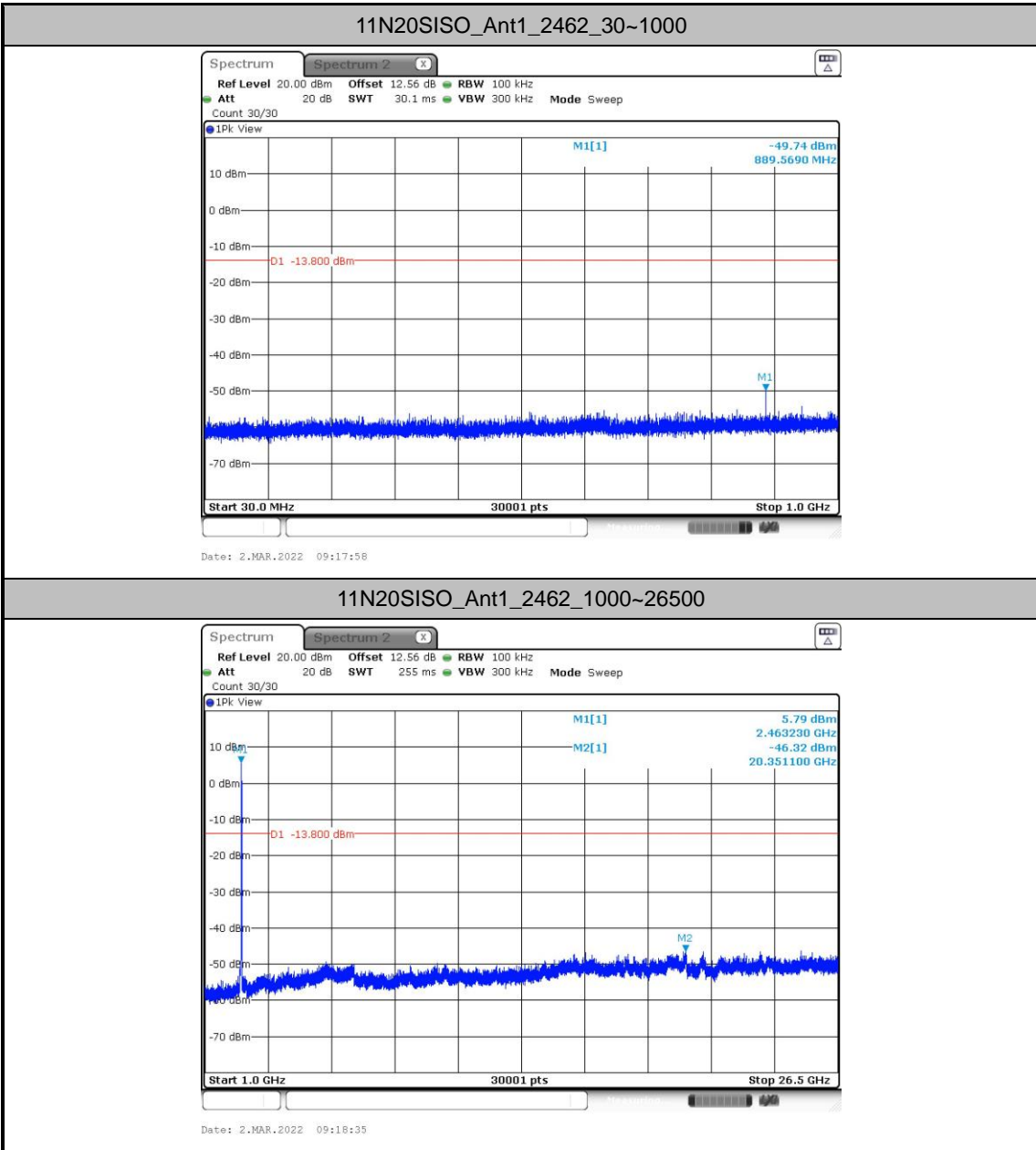


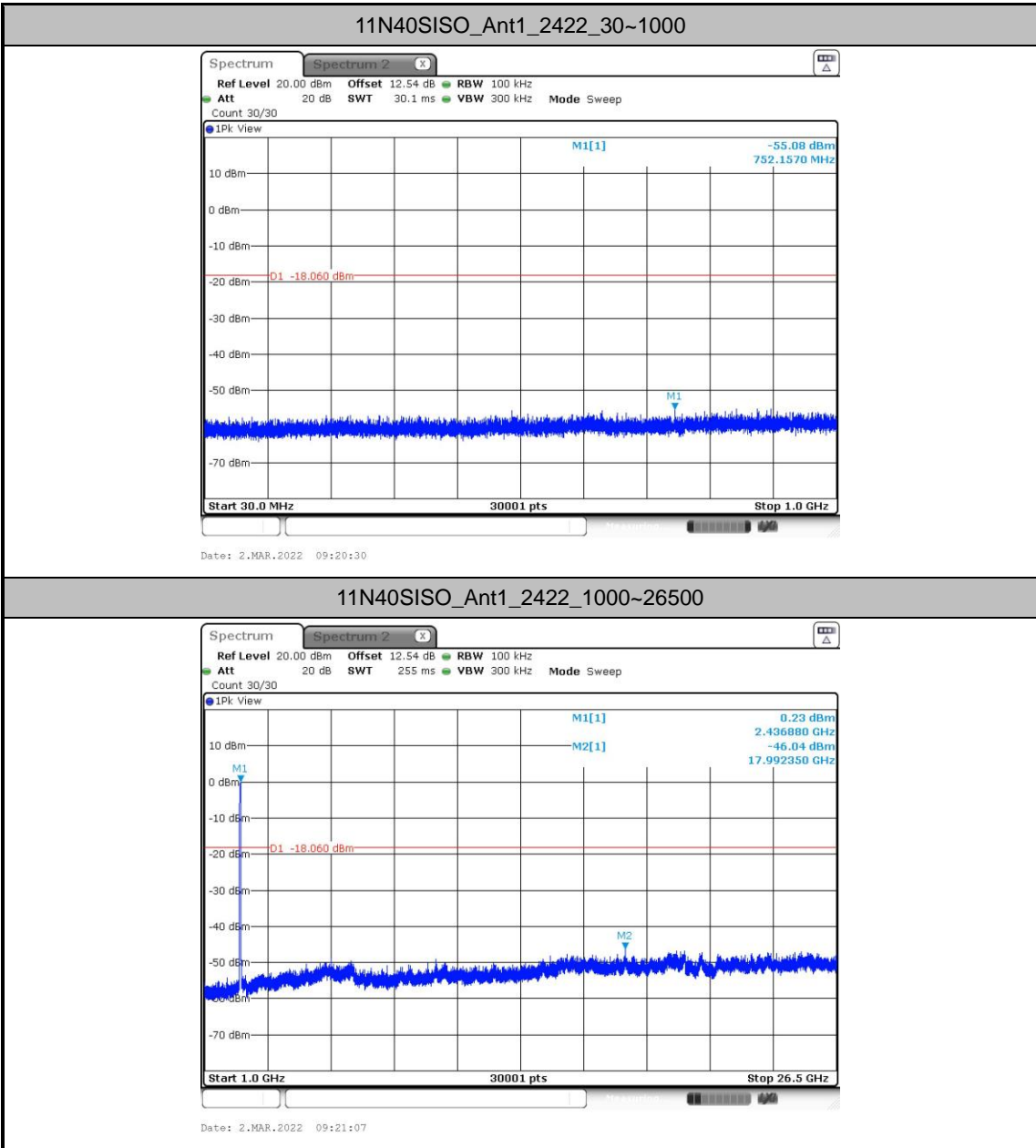


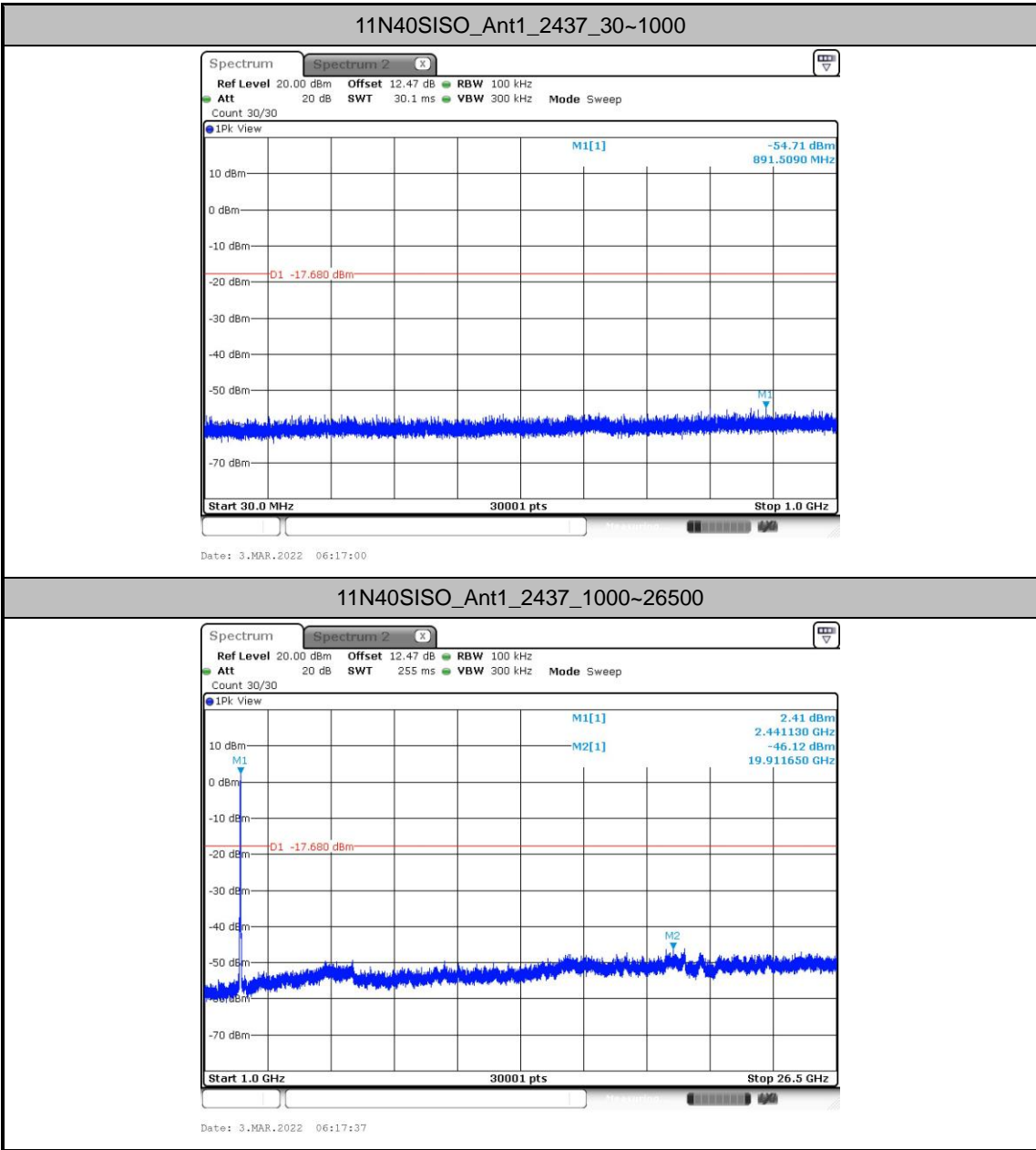


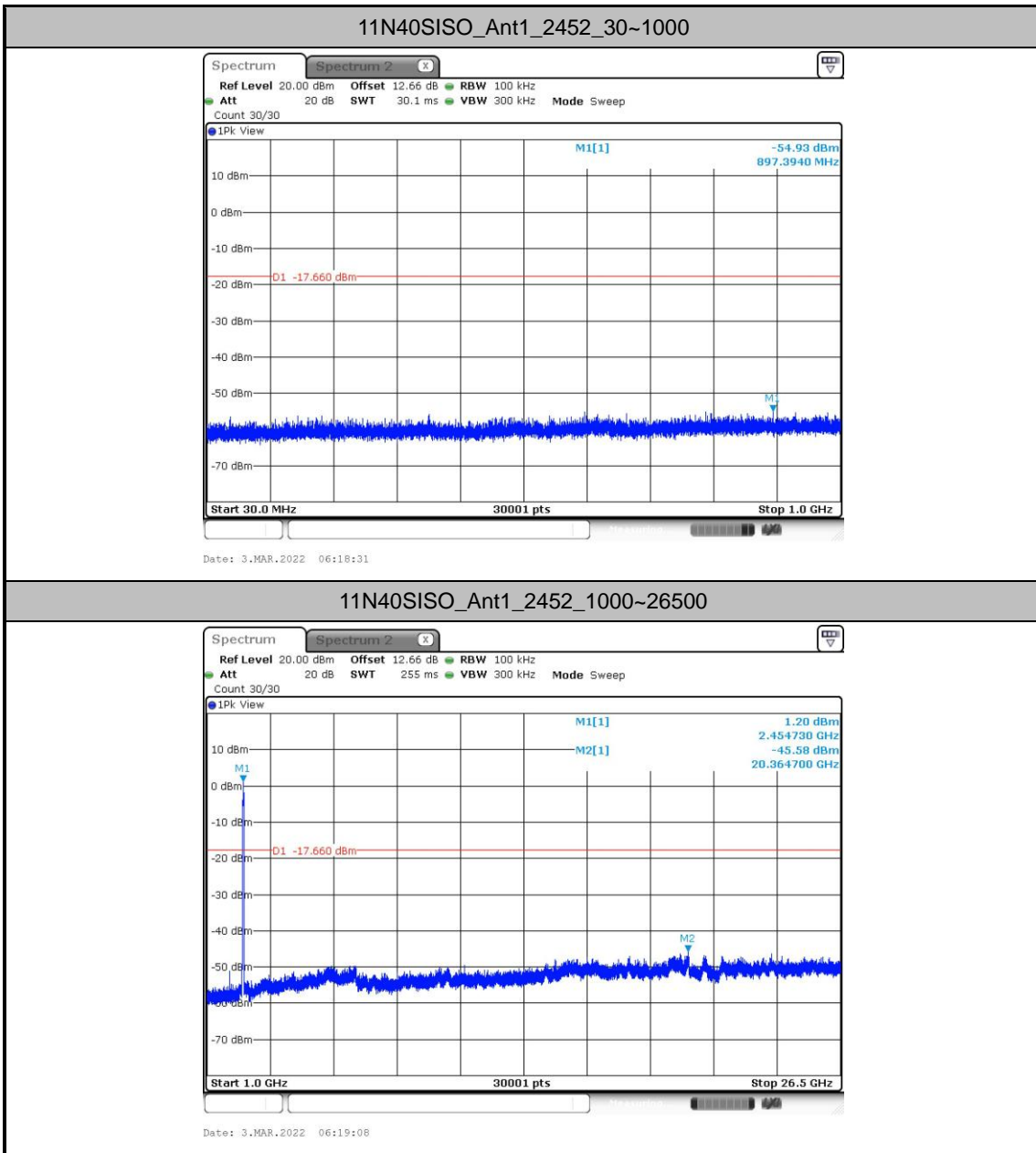








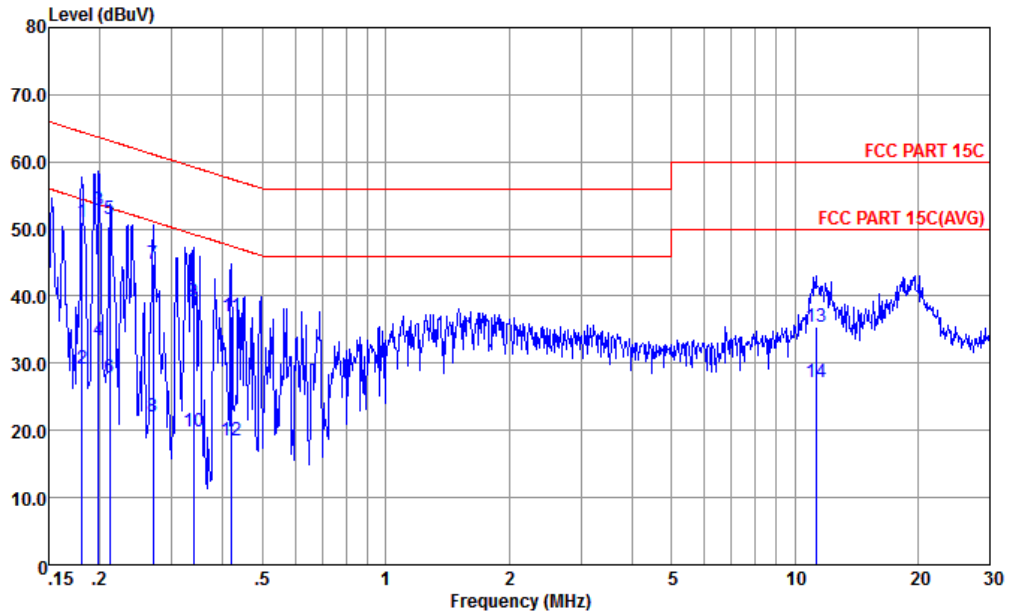






Appendix B. AC Conducted Emission Test Results

Test Engineer :	Amos Zhao	Temperature :	25.3~26.2°C
		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.		

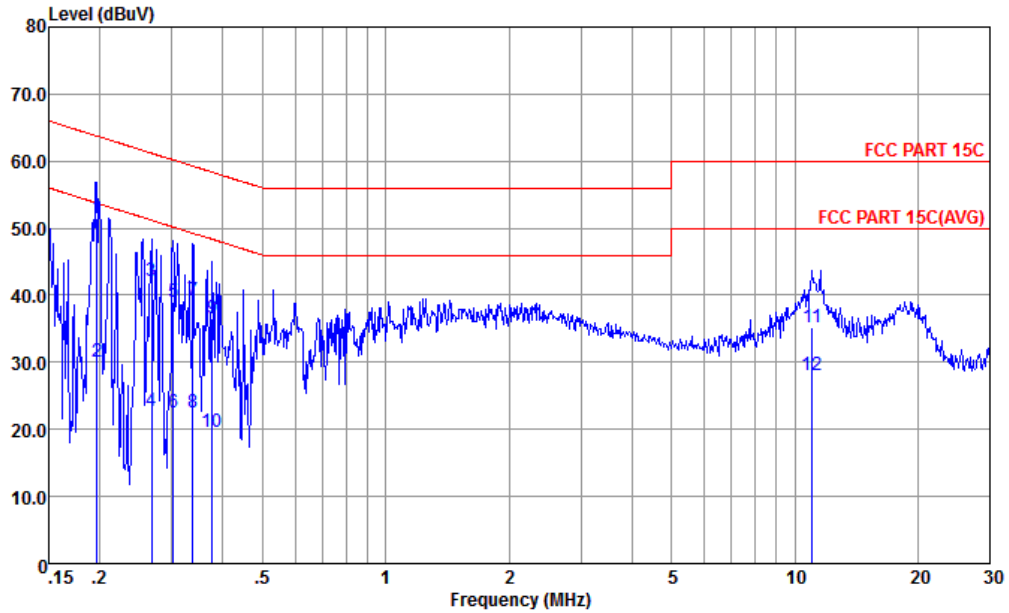


Site : CO01-KS
Condition : FCC PART 15C LISN-060105-L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.181	50.94	-13.52	64.46	40.51	0.03	10.40	QP
2	0.181	29.24	-25.22	54.46	18.81	0.03	10.40	Average
3 *	0.199	52.91	-10.76	63.67	42.50	0.04	10.37	QP
4	0.199	33.51	-20.16	53.67	23.10	0.04	10.37	Average
5	0.212	51.50	-11.64	63.14	41.10	0.04	10.36	QP
6	0.212	27.90	-25.24	53.14	17.50	0.04	10.36	Average
7	0.270	44.88	-16.24	61.12	34.50	0.06	10.32	QP
8	0.270	21.98	-29.14	51.12	11.60	0.06	10.32	Average
9	0.339	39.17	-20.05	59.22	28.80	0.08	10.29	QP
10	0.339	19.87	-29.35	49.22	9.50	0.08	10.29	Average
11	0.419	36.95	-20.51	57.46	26.60	0.09	10.26	QP
12	0.419	18.55	-28.91	47.46	8.20	0.09	10.26	Average
13	11.257	35.40	-24.60	60.00	24.80	0.24	10.36	QP
14	11.257	27.20	-22.80	50.00	16.60	0.24	10.36	Average



Test Engineer :	Amos Zhao	Temperature :	25.3~26.2°C
		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.		



Site : CO01-KS
 Condition : FCC PART 15C LISN-060105-N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.197	51.57	-12.19	63.76	41.10	0.10	10.37	QP
2	0.197	30.07	-23.69	53.76	19.60	0.10	10.37	Average
3	0.267	42.22	-18.98	61.20	31.80	0.10	10.32	QP
4	0.267	22.62	-28.58	51.20	12.20	0.10	10.32	Average
5	0.302	38.91	-21.28	60.19	28.50	0.10	10.31	QP
6	0.302	22.61	-27.58	50.19	12.20	0.10	10.31	Average
7	0.337	39.19	-20.08	59.27	28.80	0.10	10.29	QP
8	0.337	22.59	-26.68	49.27	12.20	0.10	10.29	Average
9	0.377	36.58	-21.76	58.34	26.20	0.10	10.28	QP
10	0.377	19.58	-28.76	48.34	9.20	0.10	10.28	Average
11	11.021	35.10	-24.90	60.00	24.50	0.25	10.35	QP
12	11.021	28.10	-21.90	50.00	17.50	0.25	10.35	Average

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



Appendix C. Radiated Spurious Emission

Test Engineer :	Henry LI	Temperature :	22~23°C
		Relative Humidity :	41~42%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB μ V)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2350.95	54.27	-19.73	74	49.29	30.83	7.07	32.92	286	25	P	H
		2389.95	42.96	-11.04	54	37.7	30.94	7.16	32.84	286	25	A	H
	*	2412	102.06	-	-	96.72	31	7.18	32.84	286	25	P	H
	*	2410	98.76	-	-	93.42	31	7.18	32.84	286	25	A	H
		2389.3	53.38	-20.62	74	48.16	30.94	7.16	32.88	100	79	P	V
		2389.82	42.83	-11.17	54	37.57	30.94	7.16	32.84	100	79	A	V
	*	2412	99.65	-	-	94.31	31	7.18	32.84	100	79	P	V
	*	2414	96.37	-	-	91.03	31	7.18	32.84	100	79	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dB μ V/m)	(dB)	(dB μ V/m)	(dB μ V)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		4830	49.18	-24.82	74	66.09	34.64	10.26	61.81	300	0	P	H
		4830	54.08	-19.92	74	70.99	34.64	10.26	61.81	268	194	P	V
		4830	50.71	-3.29	54	67.62	34.64	10.26	61.81	268	194	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Band Edge @ 3m)**

WIFI Ant. 1	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)
802.11n HT20 CH 01 2412MHz		2389.82	57.82	-16.18	74	52.56	30.94	7.16	32.84	258	345	P	H
		2389.82	47.61	-6.39	54	42.35	30.94	7.16	32.84	258	345	A	H
	*	2410	102.08	-	-	96.74	31	7.18	32.84	258	345	P	H
	*	2410	93.82	-	-	88.48	31	7.18	32.84	258	345	A	H
		2389.95	56.99	-17.01	74	51.73	30.94	7.16	32.84	100	73	P	V
		2389.95	46.44	-7.56	54	41.18	30.94	7.16	32.84	100	73	A	V
	*	2412	99.98	-	-	94.64	31	7.18	32.84	100	73	P	V
*	2410	91.71	-	-	86.37	31	7.18	32.84	100	73	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)**

WIFI Ant. 1	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)
802.11n HT20 CH 01 2412MHz		4830	46.06	-27.94	74	62.97	34.64	10.26	61.81	300	0	P	H
		4830	48.4	-25.6	74	65.31	34.64	10.26	61.81	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

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	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)
802.11n HT40 CH 03 2422MHz		2389.43	57.51	-16.49	74	52.29	30.94	7.16	32.88	358	46	P	H
		2389.82	48.57	-5.43	54	43.31	30.94	7.16	32.84	358	46	A	H
		2493.82	54.59	-19.41	74	48.69	31.17	7.3	32.57	358	46	P	H
		2484.46	44.49	-9.51	54	38.73	31.13	7.27	32.64	358	46	A	H
	*	2438	98.45	-	-	92.92	31.07	7.23	32.77	358	46	P	H
	*	2440	90.28	-	-	84.75	31.07	7.23	32.77	358	46	A	H
		2388.91	58.4	-15.6	74	53.18	30.94	7.16	32.88	100	110	P	V
		2389.82	49.7	-4.3	54	44.44	30.94	7.16	32.84	100	110	A	V
		2485.9	54.96	-19.04	74	49.16	31.17	7.27	32.64	100	110	P	V
		2485.06	44.21	-9.79	54	38.45	31.13	7.27	32.64	100	110	A	V
	*	2432	97.43	-	-	91.97	31.03	7.2	32.77	100	110	P	V
	*	2434	89.83	-	-	84.33	31.07	7.2	32.77	100	110	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	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)
802.11n HT40 CH 03 2422MHz		4845	43.46	-30.54	74	60.35	34.62	10.28	61.79	300	0	P	H
		7260	43.56	-30.44	74	57	35.9	12.71	62.05	300	0	P	H
		4845	44.36	-29.64	74	61.25	34.62	10.28	61.79	100	0	P	V
		7260	43.63	-30.37	74	57.07	35.9	12.71	62.05	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11b LF		43.58	25.31	-14.69	40	38.87	17.32	0.78	31.66	-	-	P	H
		94.02	21.56	-21.94	43.5	35.68	16.27	1.54	31.93	-	-	P	H
		153.19	30.05	-13.45	43.5	42.85	16.53	1.99	31.32	-	-	P	H
		238.55	29.87	-16.13	46	40.88	17.86	2.49	31.36	-	-	P	H
		392.78	26.6	-19.4	46	33.15	21.51	3.23	31.29	-	-	P	H
		960.23	29.07	-24.93	54	27.1	27.27	5.05	30.35	-	-	P	H
		41.64	34.14	-5.86	40	46.18	18.86	0.75	31.65	-	-	P	V
		92.08	25.71	-17.79	43.5	39.68	16.42	1.51	31.9	-	-	P	V
		153.19	27.64	-15.86	43.5	39.54	17.43	1.99	31.32	-	-	P	V
		173.56	26.9	-16.6	43.5	39.17	16.94	2.12	31.33	-	-	P	V
		237.58	26.91	-19.09	46	37.15	18.62	2.49	31.35	-	-	P	V
		382.11	25.53	-20.47	46	31.49	22.24	3.18	31.38	-	-	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	Peak or Average
H/V	Horizontal or Vertical



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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. Duty Cycle Plots

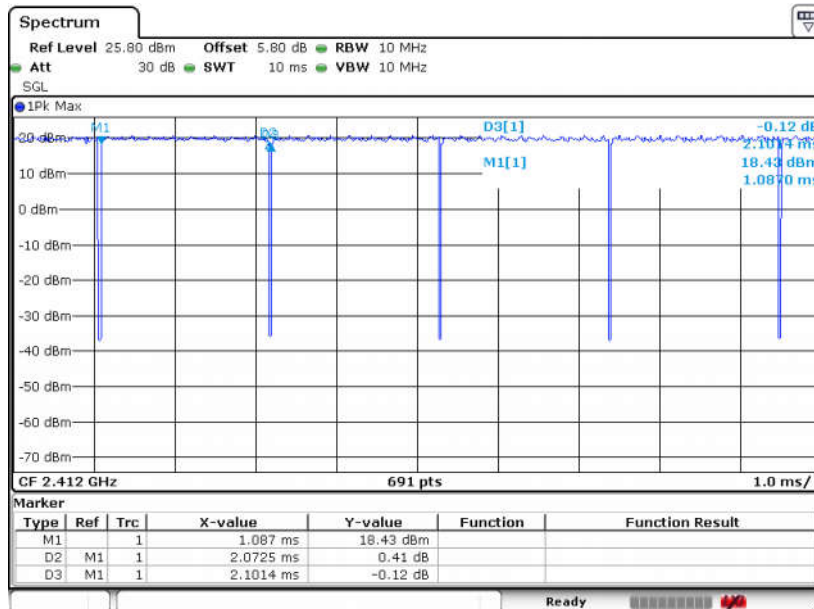
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	98.62	-	-	10Hz
802.11n HT20	97.79	1.928	0.519	0.56KHz
802.11n HT40	94.93	0.949	1.053	1.1KHz



802.11b

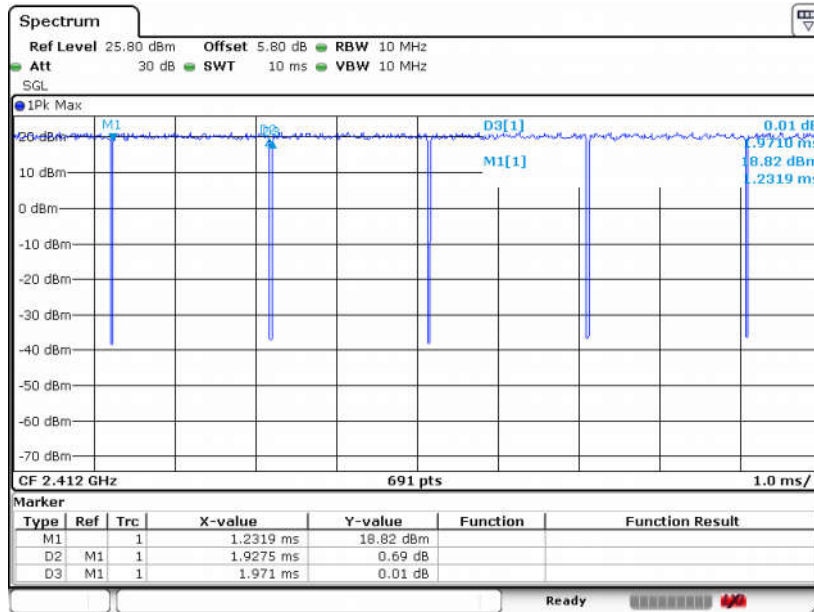


802.11g





802.11n HT20



802.11n HT40

