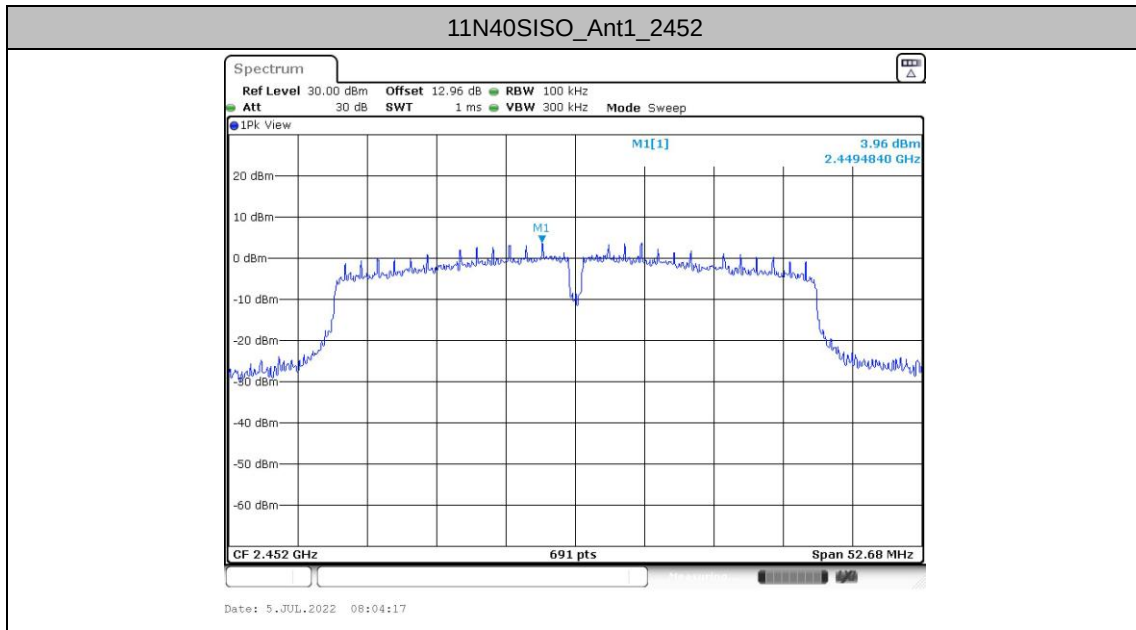




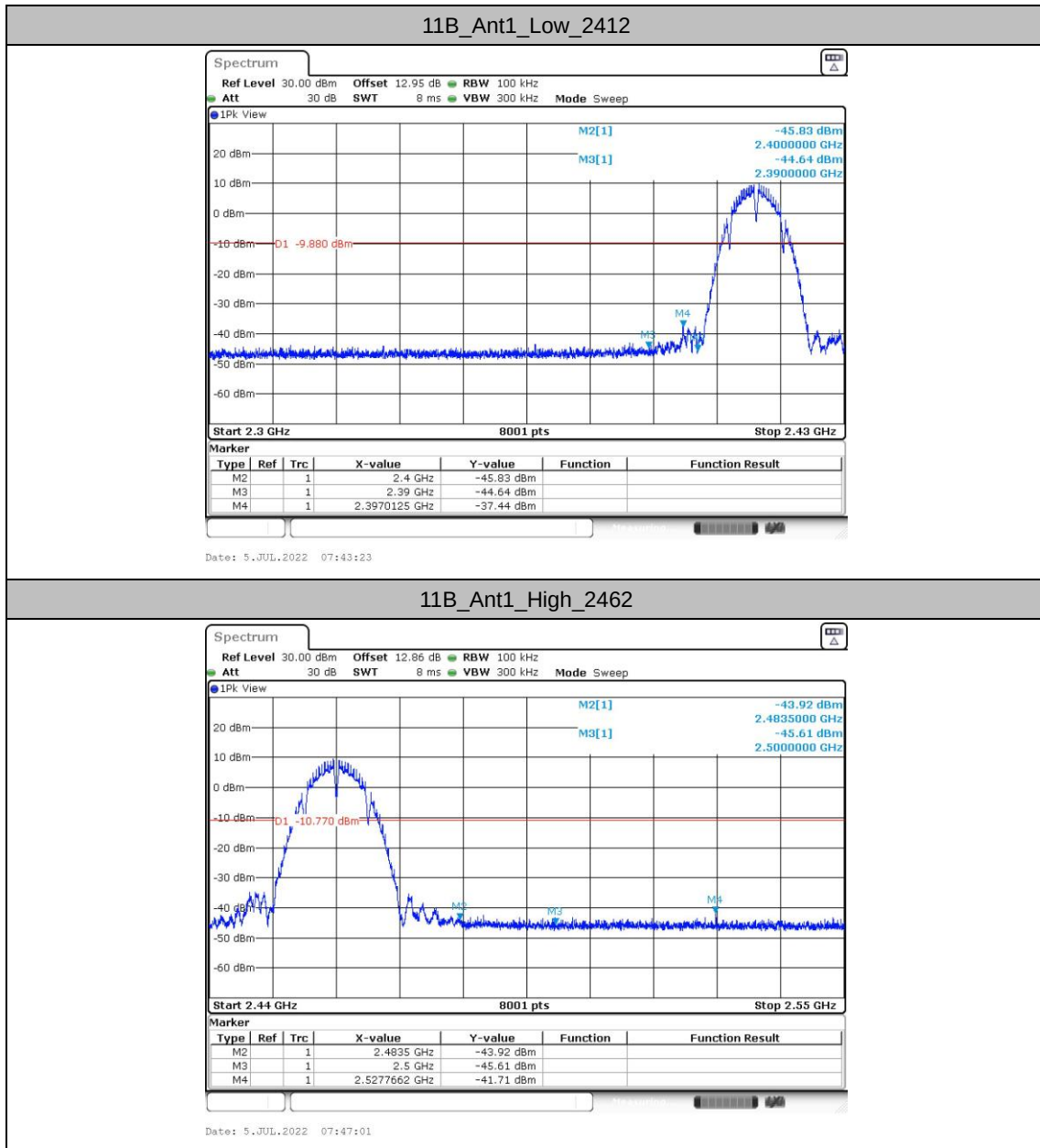
Band edge measurements

Test Result

TestMode	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Low	2412	10.12	-37.44	≤ -9.88	PASS
	High	2462	9.23	-41.71	≤ -10.77	PASS
11G	Low	2412	7.57	-19.06	≤ -12.43	PASS
	High	2457	6.98	-40.15	≤ -13.02	PASS
		2462	6.94	-32.69	≤ -13.06	PASS
11N20SISO	Low	2412	7.03	-18.72	≤ -12.97	PASS
	High	2457	6.90	-39.71	≤ -13.1	PASS
		2462	6.25	-31.84	≤ -13.75	PASS
11N40SISO	Low	2422	2.93	-23.08	≤ -17.07	PASS
		2427	-0.06	-35.27	≤ -20.06	PASS
	High	2442	1.10	-41.07	≤ -18.9	PASS
		2447	0.21	-37.93	≤ -19.79	PASS
		2452	3.96	-27.56	≤ -16.04	PASS

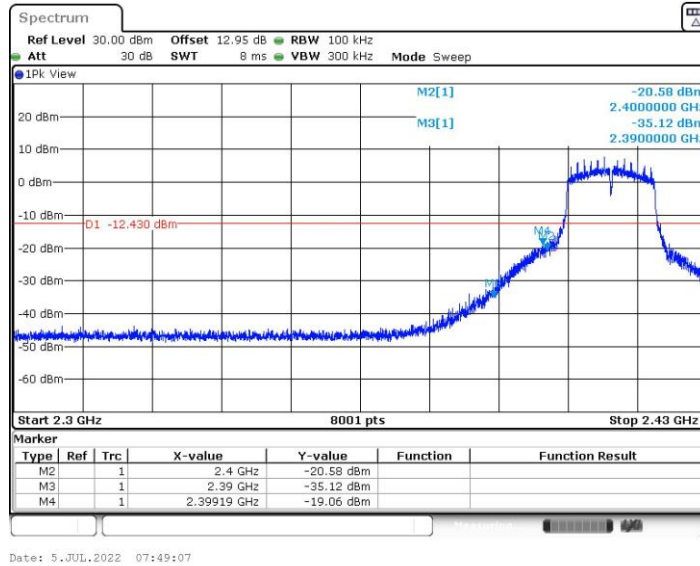


Test Graphs

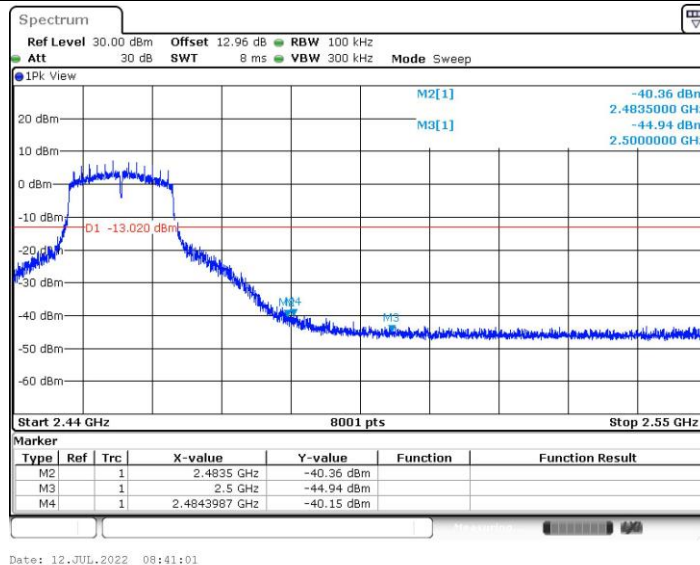




11G_Ant1_Low_2412

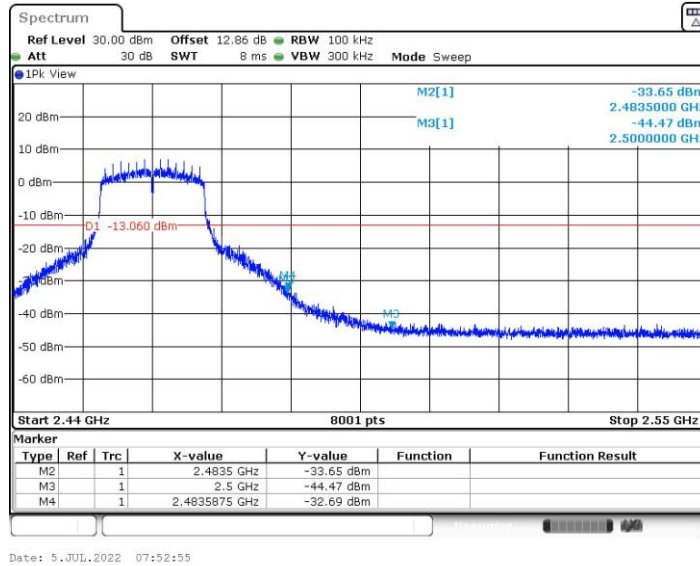


11G_Ant1_High_2457

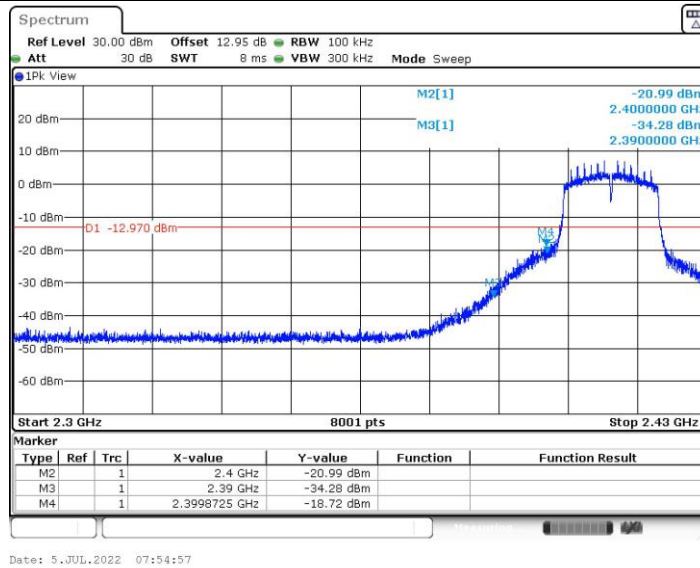




11G_Ant1_High_2462

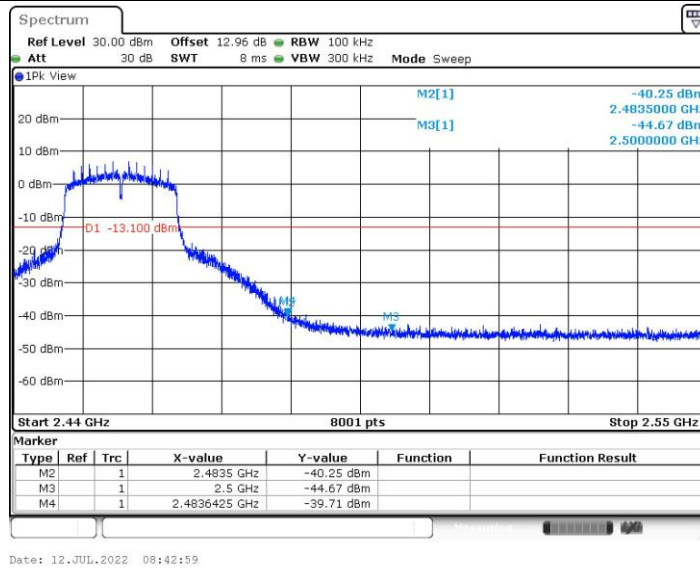


11N20SISO_Ant1_Low_2412

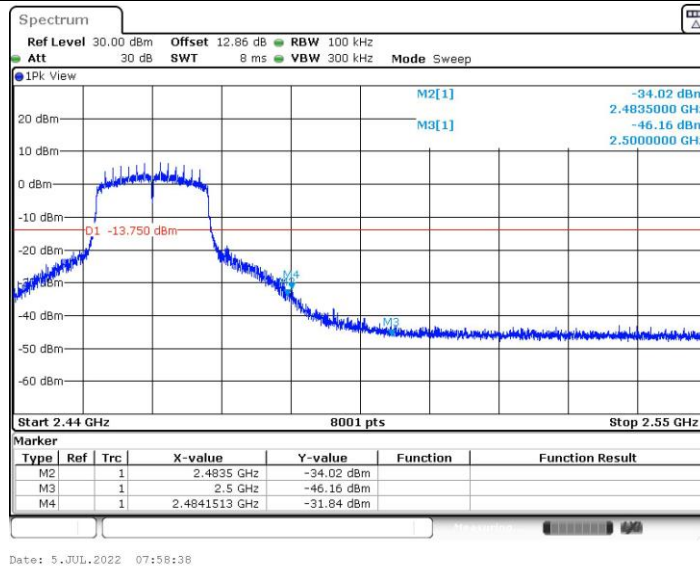




11N20SISO_Ant1_High_2457

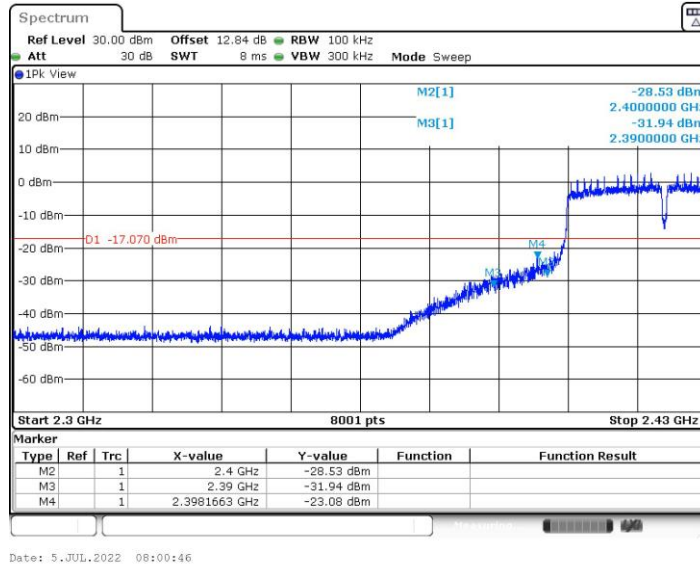


11N20SISO_Ant1_High_2462

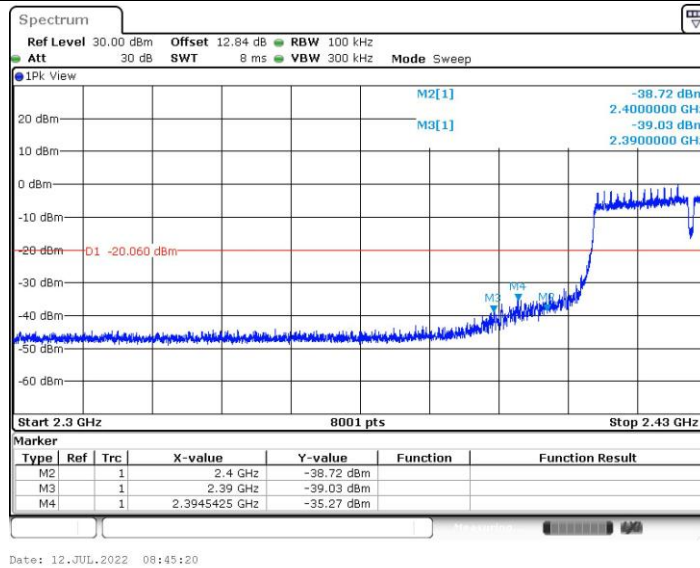




11N40SISO_Ant1_Low_2422

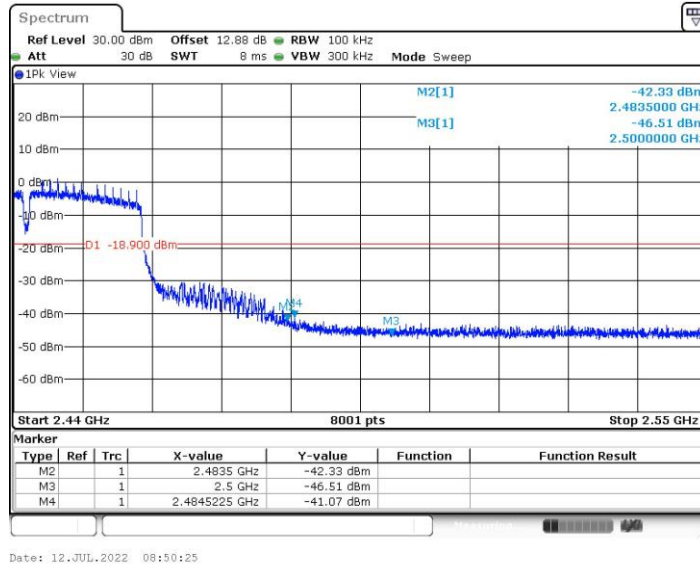


11N40SISO_Ant1_Low_2427

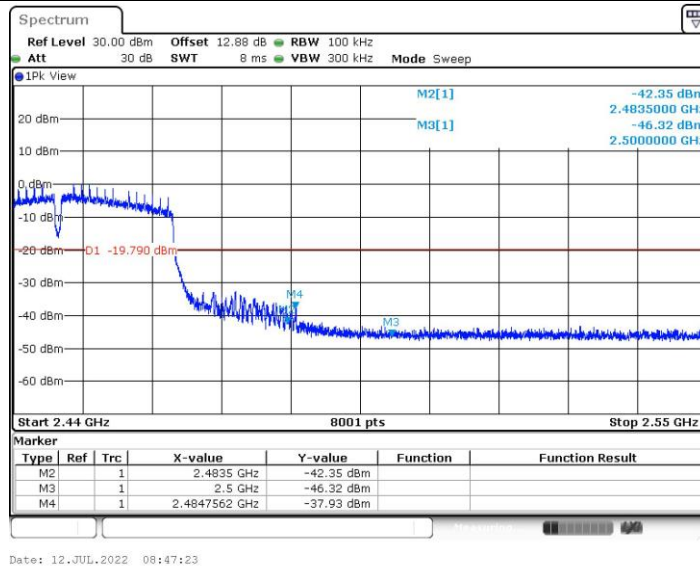


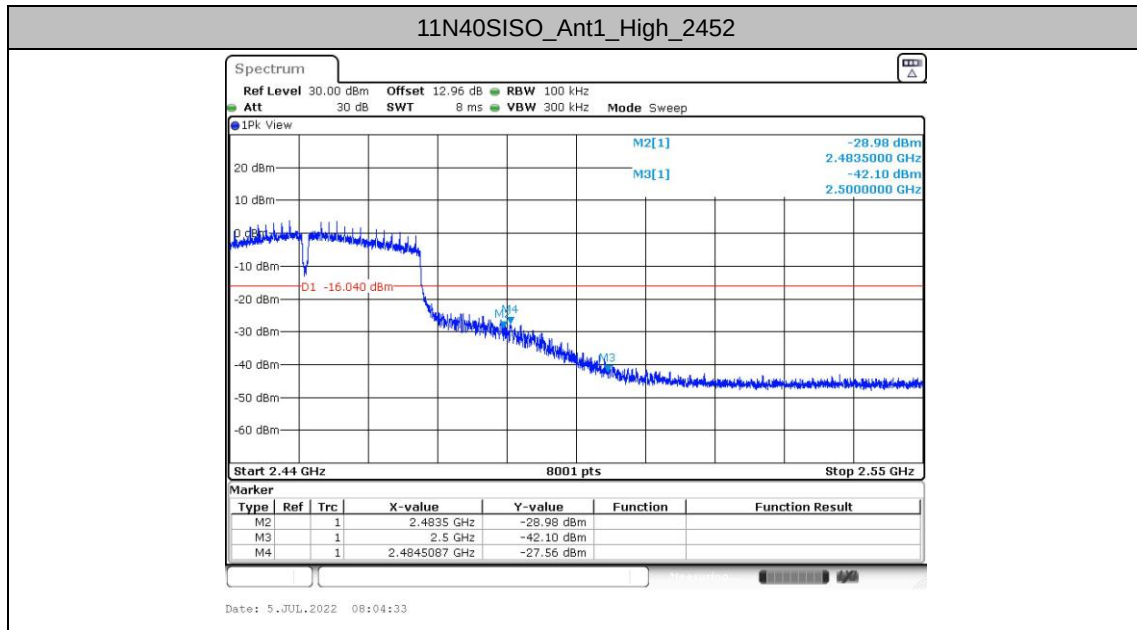


11N40SISO_Ant1_High_2442



11N40SISO_Ant1_High_2447







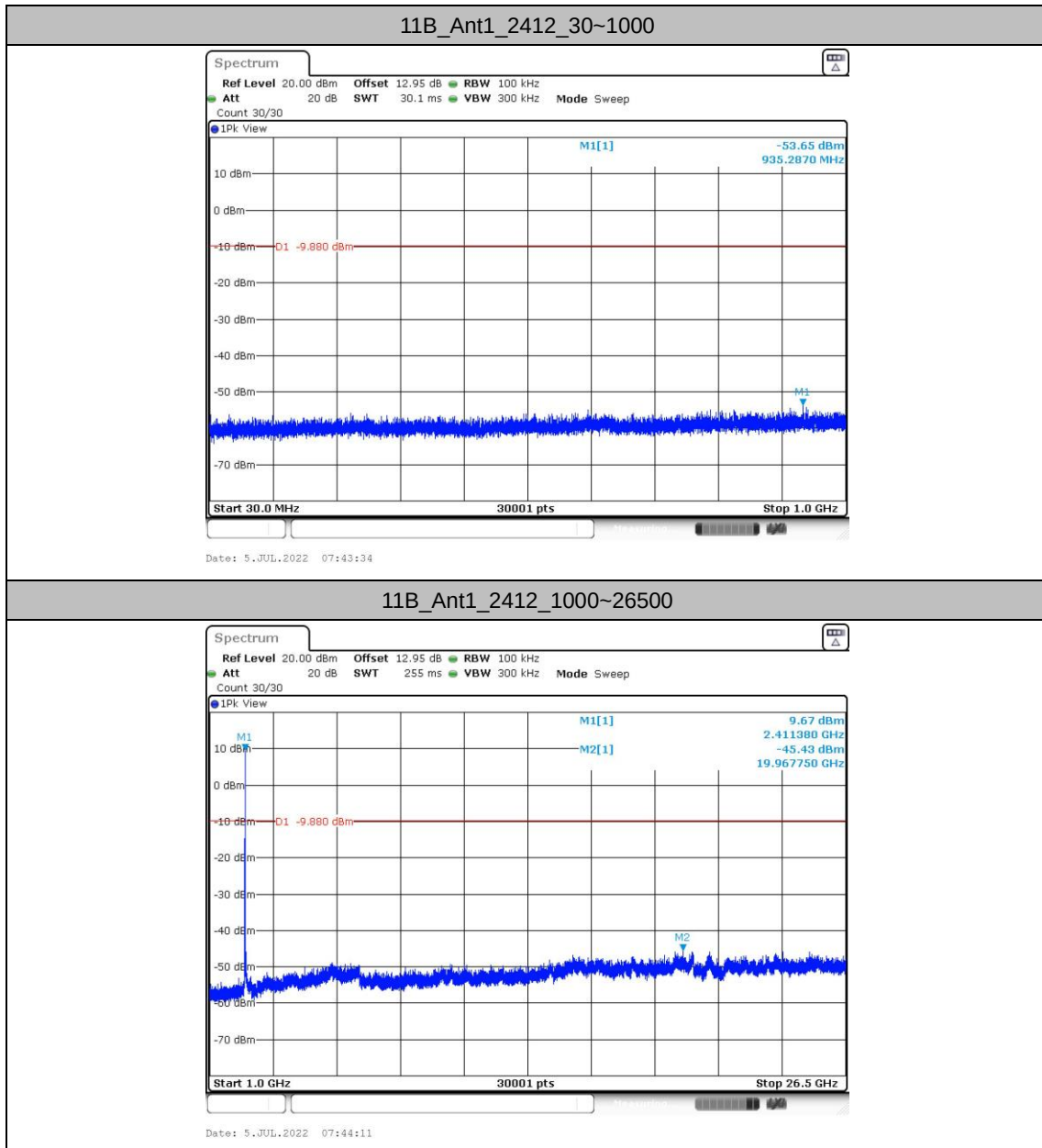
Conducted Spurious Emission

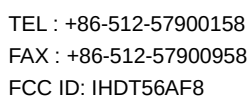
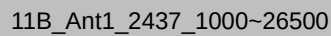
Test Result

TestMode	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	2412	30~1000	10.12	-53.65	≤-9.88	PASS
		1000~26500	10.12	-45.43	≤-9.88	PASS
	2437	30~1000	9.35	-54.16	≤-10.65	PASS
		1000~26500	9.35	-45.51	≤-10.65	PASS
	2462	30~1000	9.23	-54.55	≤-10.77	PASS
		1000~26500	9.23	-45.62	≤-10.77	PASS
11G	2412	30~1000	7.57	-54.17	≤-12.43	PASS
		1000~26500	7.57	-45.2	≤-12.43	PASS
	2437	30~1000	6.75	-54.16	≤-13.25	PASS
		1000~26500	6.75	-45.86	≤-13.25	PASS
	2457	30~1000	6.98	-54.22	≤-13.02	PASS
		1000~26500	6.98	-45.98	≤-13.02	PASS
	2462	30~1000	6.94	-54.35	≤-13.06	PASS
		1000~26500	6.94	-45.55	≤-13.06	PASS
11N20SISO	2412	30~1000	7.03	-54.32	≤-12.97	PASS
		1000~26500	7.03	-45.24	≤-12.97	PASS
	2437	30~1000	6.23	-52.88	≤-13.77	PASS
		1000~26500	6.23	-45.76	≤-13.77	PASS
	2457	30~1000	6.90	-53.63	≤-13.1	PASS
		1000~26500	6.90	-44.85	≤-13.1	PASS
	2462	30~1000	6.25	-54.42	≤-13.75	PASS
		1000~26500	6.25	-45.34	≤-13.75	PASS
11N40SISO	2422	30~1000	2.93	-54.37	≤-17.07	PASS
		1000~26500	2.93	-45.2	≤-17.07	PASS
	2427	30~1000	-0.06	-55.12	≤-20.06	PASS
		1000~26500	-0.06	-45.4	≤-20.06	PASS
	2437	30~1000	3.18	-54.65	≤-16.82	PASS
		1000~26500	3.18	-44.93	≤-16.82	PASS
	2442	30~1000	1.10	-54.2	≤-18.9	PASS
		1000~26500	1.10	-43.96	≤-18.9	PASS
	2447	30~1000	0.21	-54.5	≤-19.79	PASS
		1000~26500	0.21	-44.99	≤-19.79	PASS
	2452	30~1000	3.96	-53.74	≤-16.04	PASS
		1000~26500	3.96	-45.48	≤-16.04	PASS



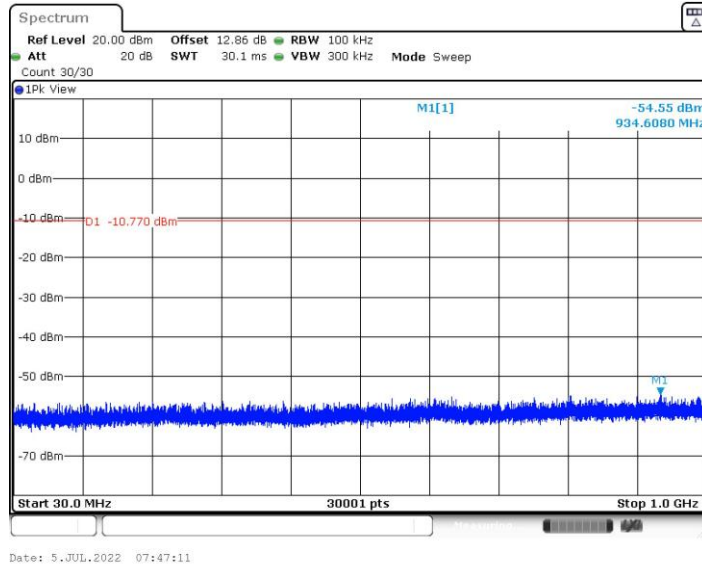
Test Graphs



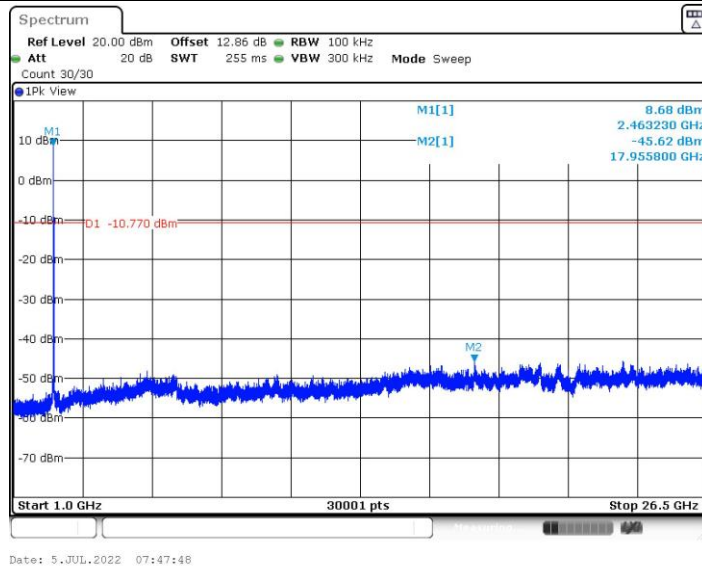




11B_Ant1_2462_30~1000

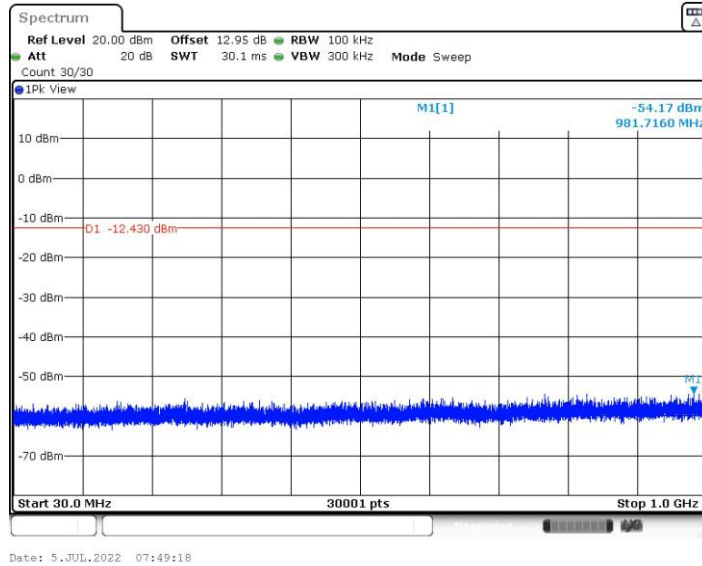


11B_Ant1_2462_1000~26500

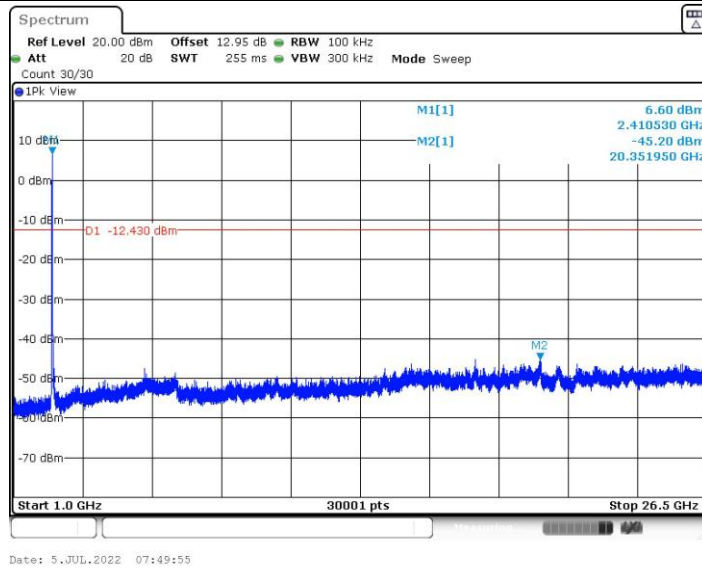


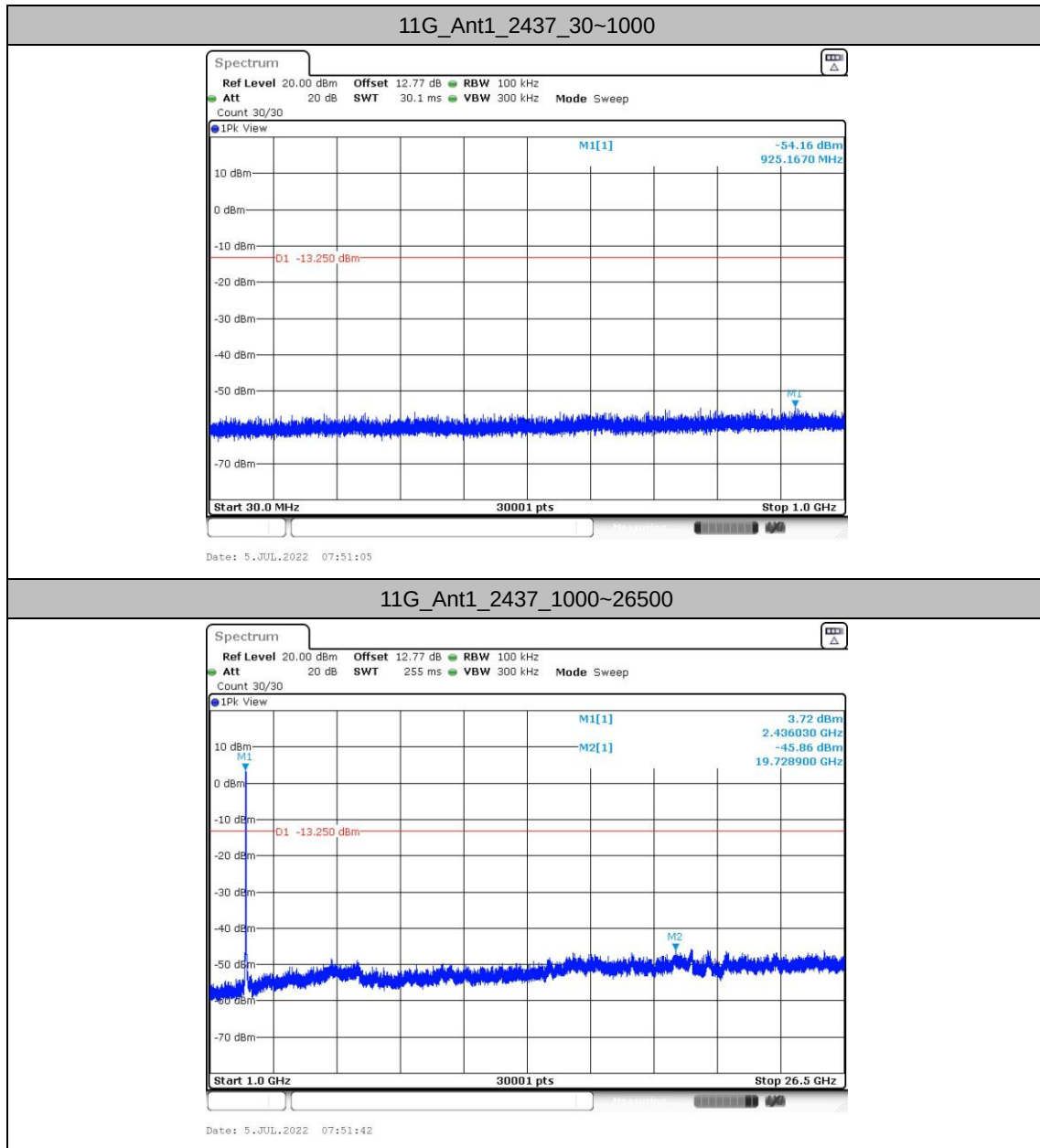


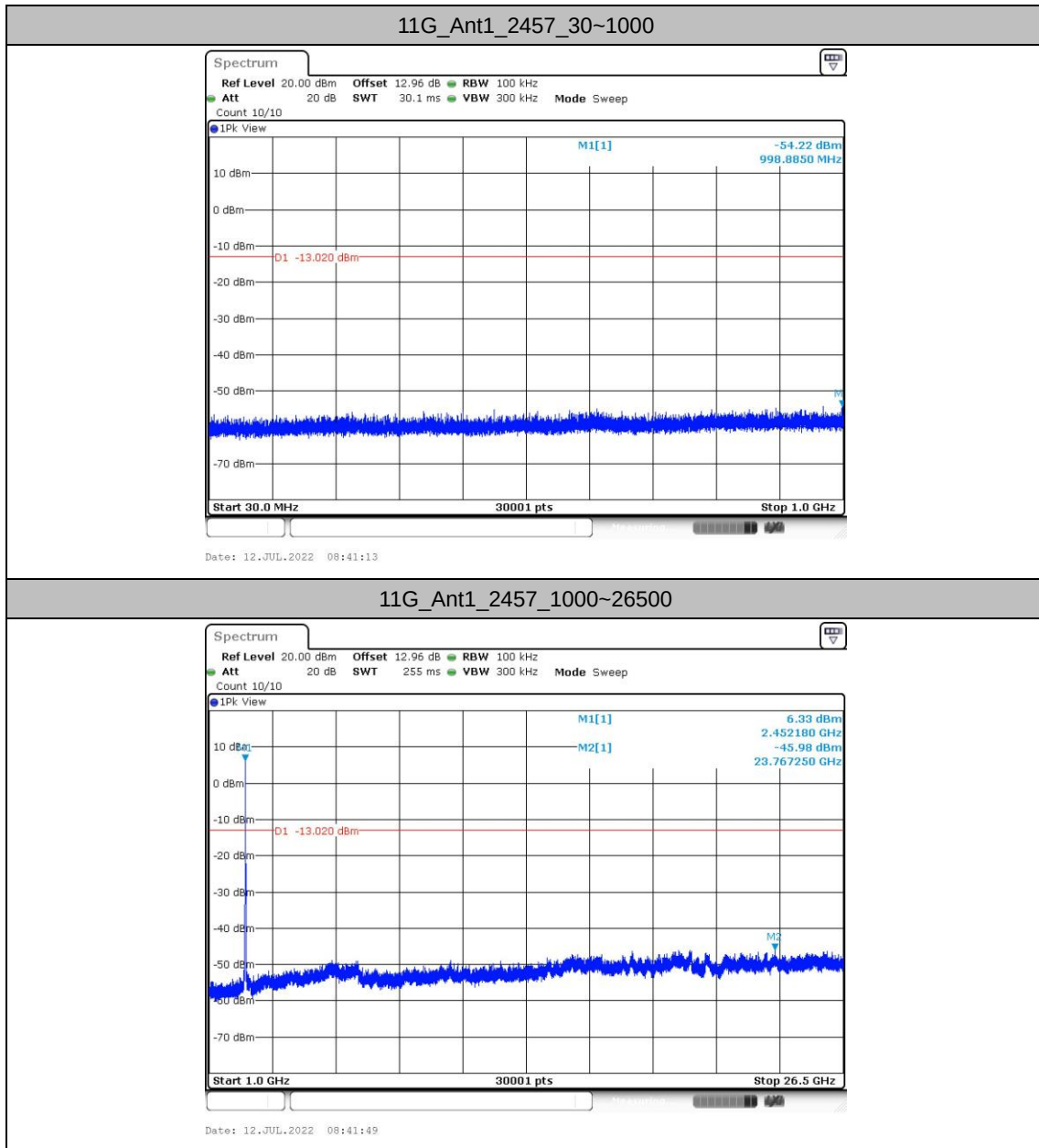
11G_Ant1_2412_30~1000



11G_Ant1_2412_1000~26500

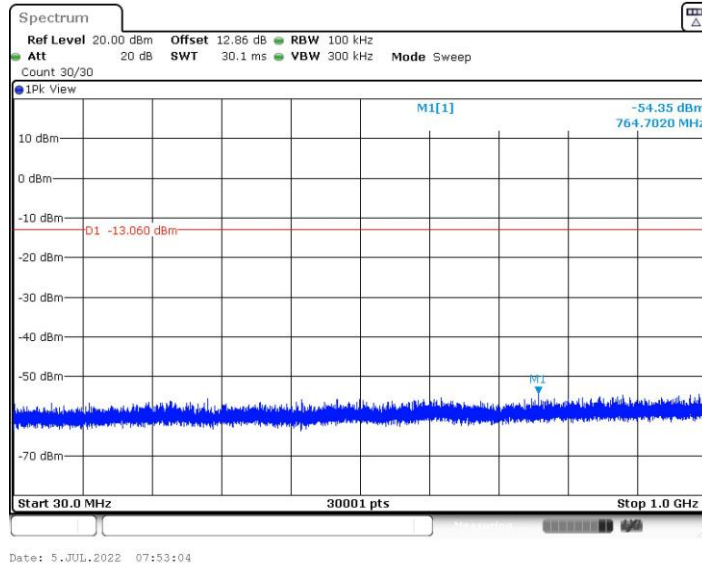




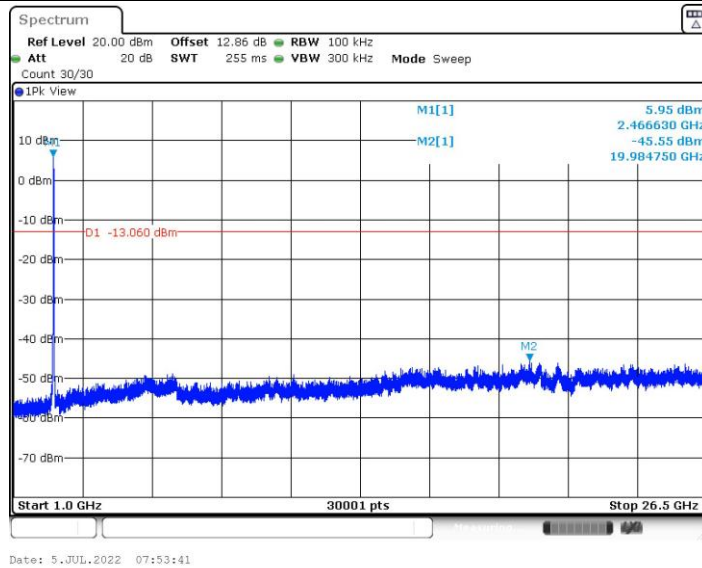




11G_Ant1_2462_30~1000

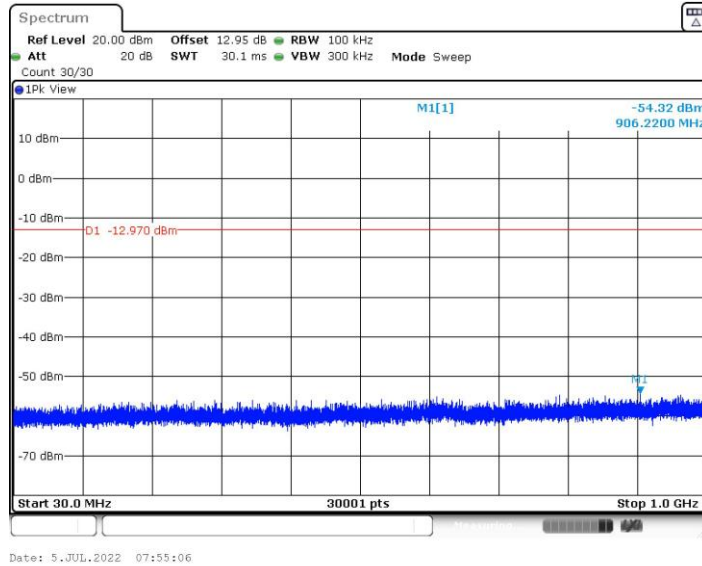


11G_Ant1_2462_1000~26500

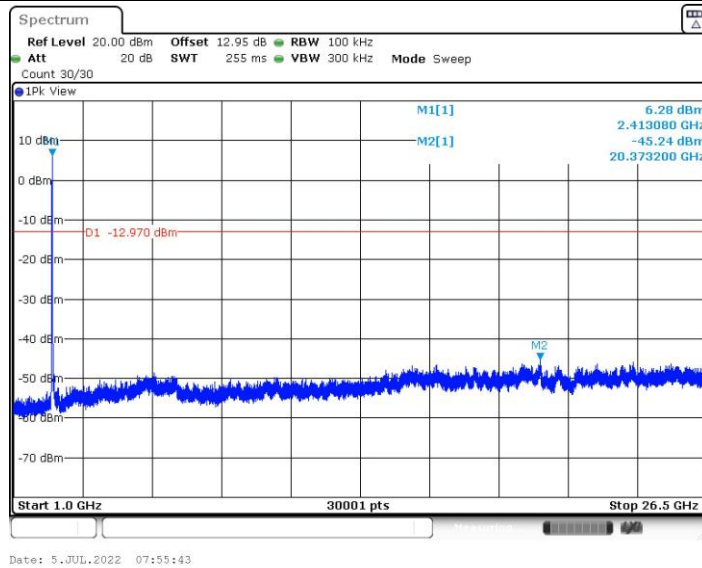




11N20SISO_Ant1_2412_30~1000

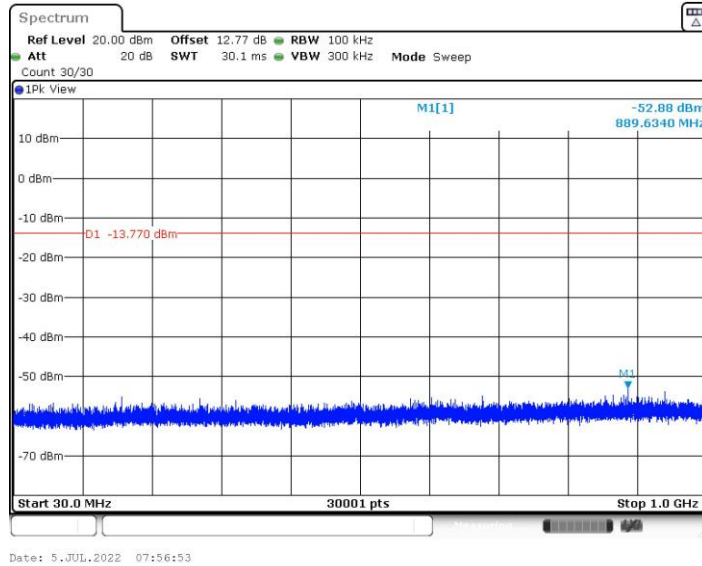


11N20SISO_Ant1_2412_1000~26500

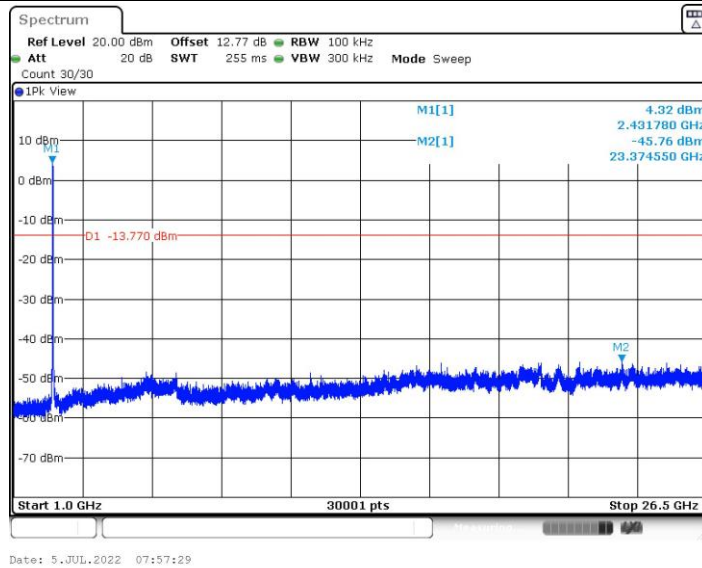




11N20SISO_Ant1_2437_30~1000

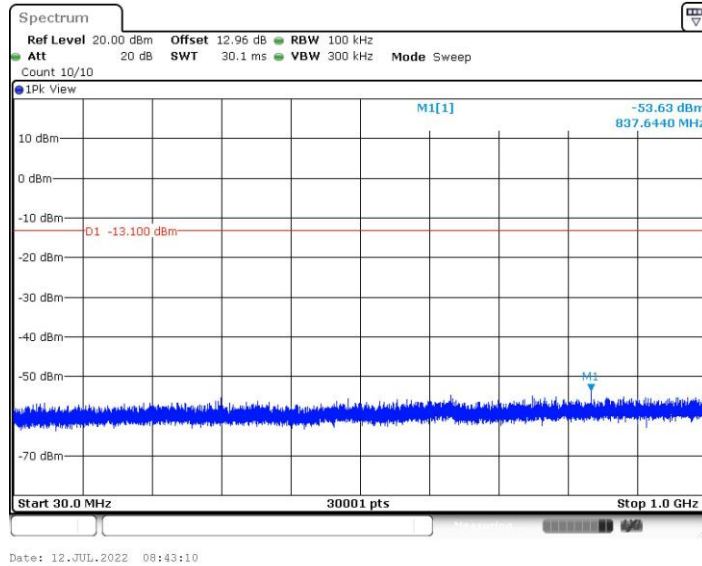


11N20SISO_Ant1_2437_1000~26500

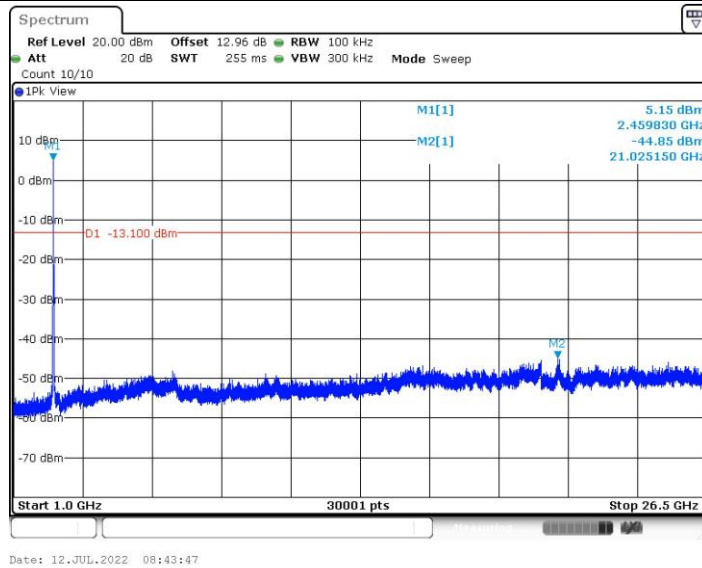




11N20SISO_Ant1_2457_30~1000

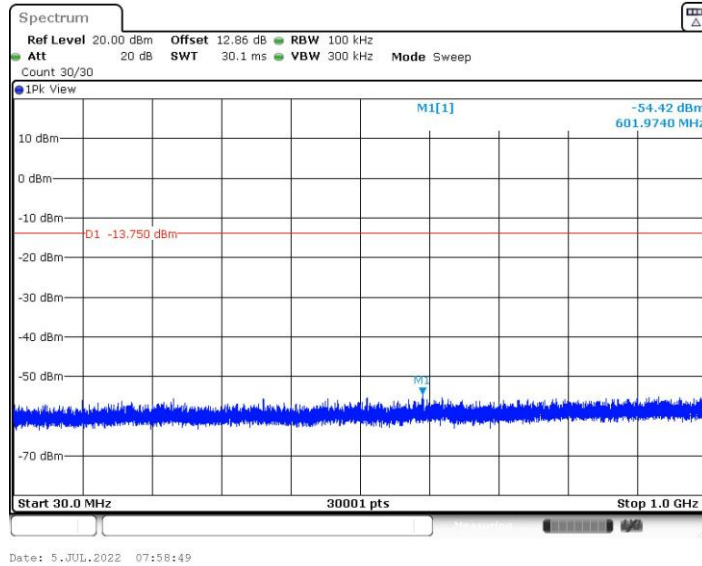


11N20SISO_Ant1_2457_1000~26500

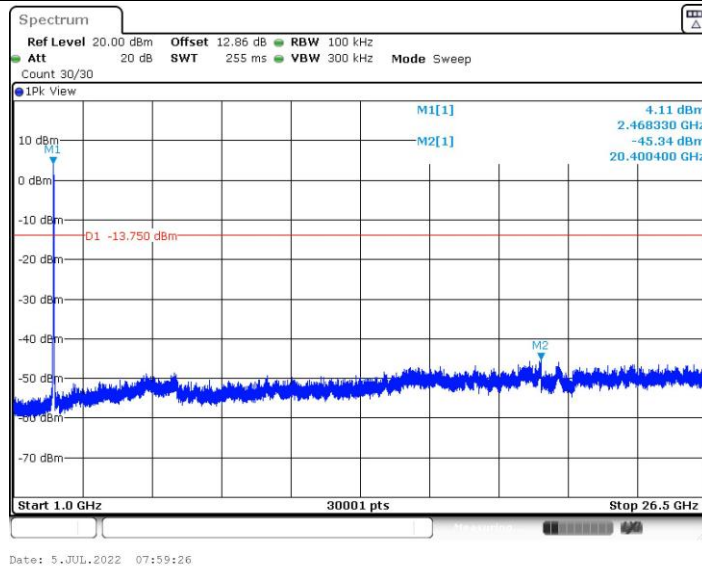




11N20SISO_Ant1_2462_30~1000

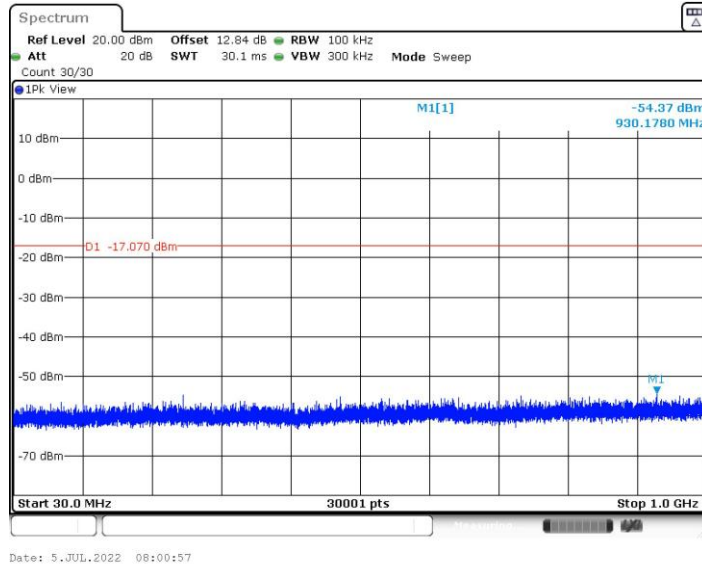


11N20SISO_Ant1_2462_1000~26500

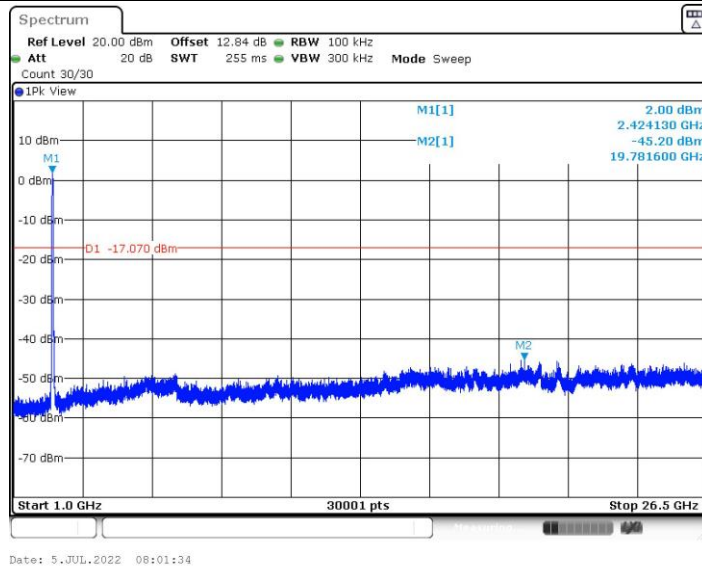




11N40SISO_Ant1_2422_30~1000

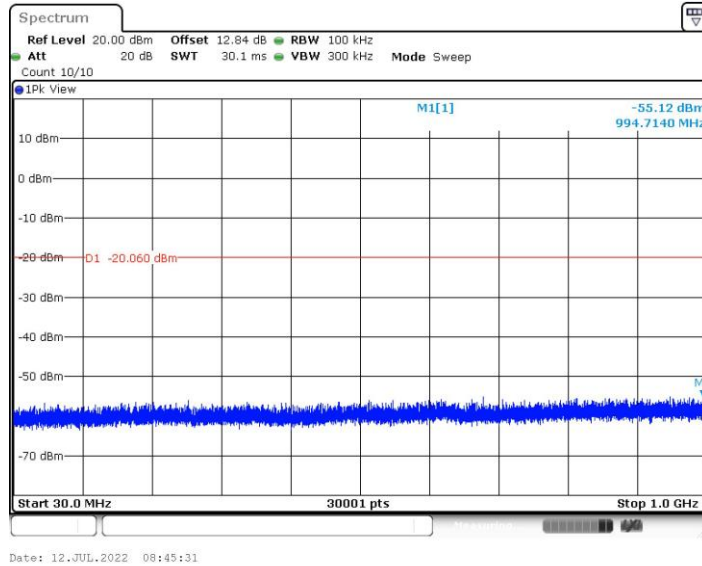


11N40SISO_Ant1_2422_1000~26500

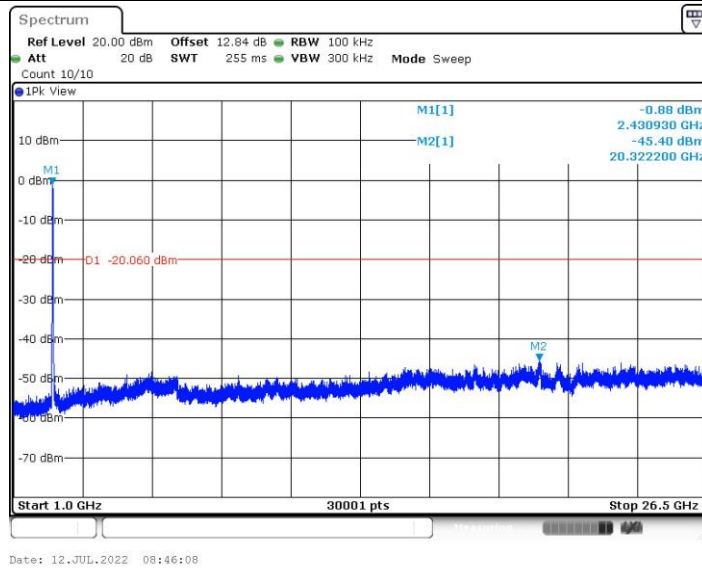




11N40SISO_Ant1_2427_30~1000

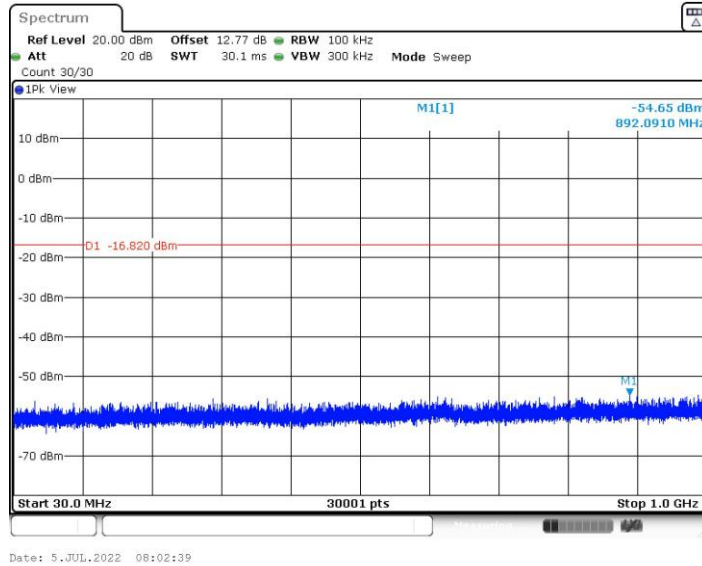


11N40SISO_Ant1_2427_1000~26500

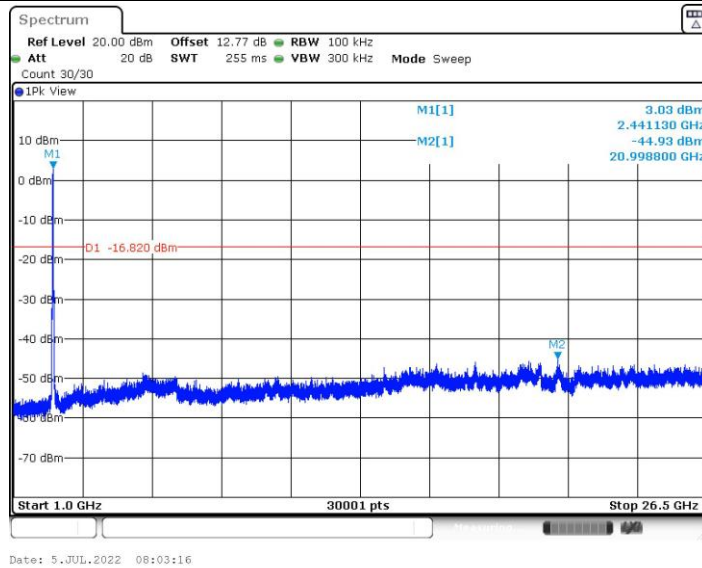




11N40SISO_Ant1_2437_30~1000

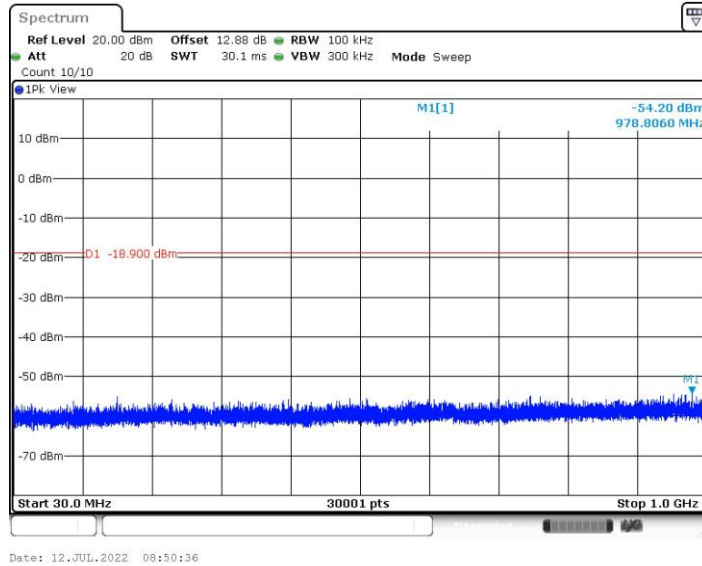


11N40SISO_Ant1_2437_1000~26500

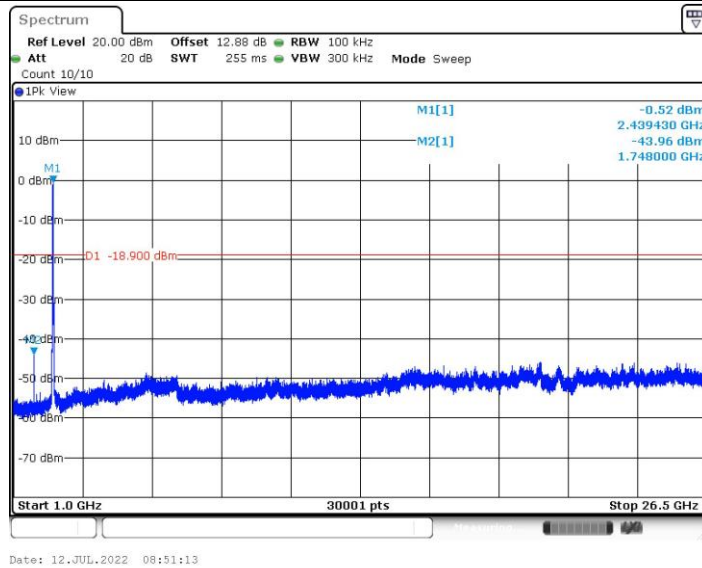




11N40SISO_Ant1_2442_30~1000

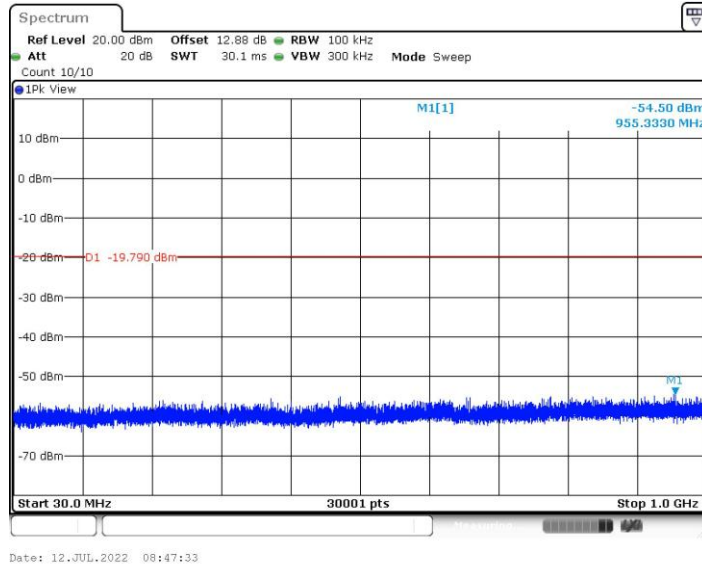


11N40SISO_Ant1_2442_1000~26500

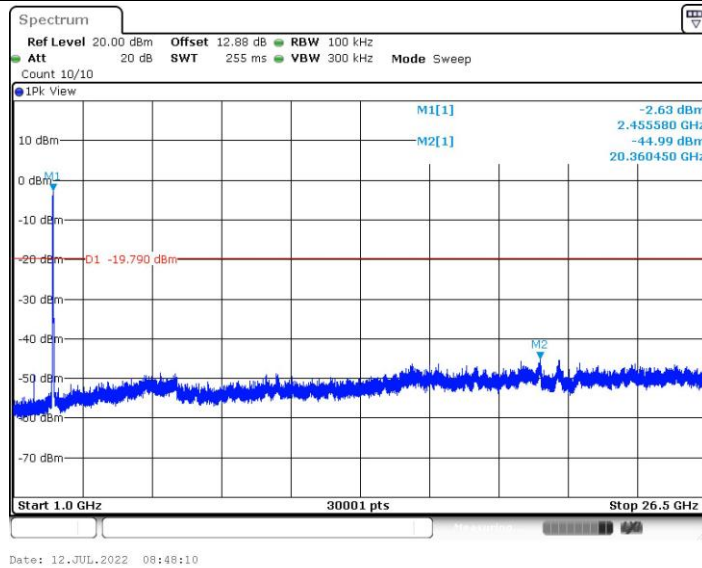




11N40SISO_Ant1_2447_30~1000

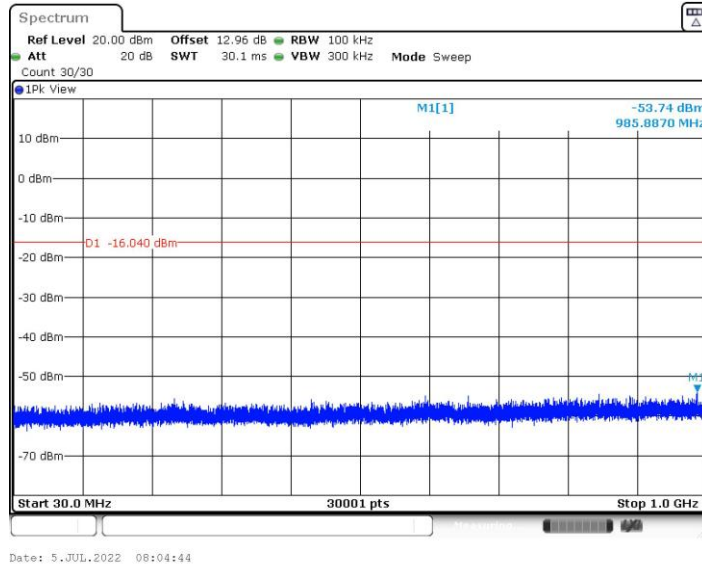


11N40SISO_Ant1_2447_1000~26500

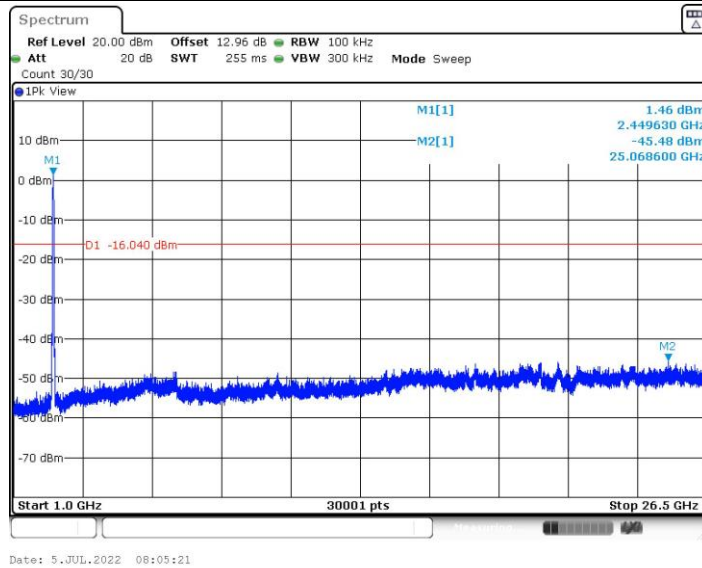




11N40SISO_Ant1_2452_30~1000



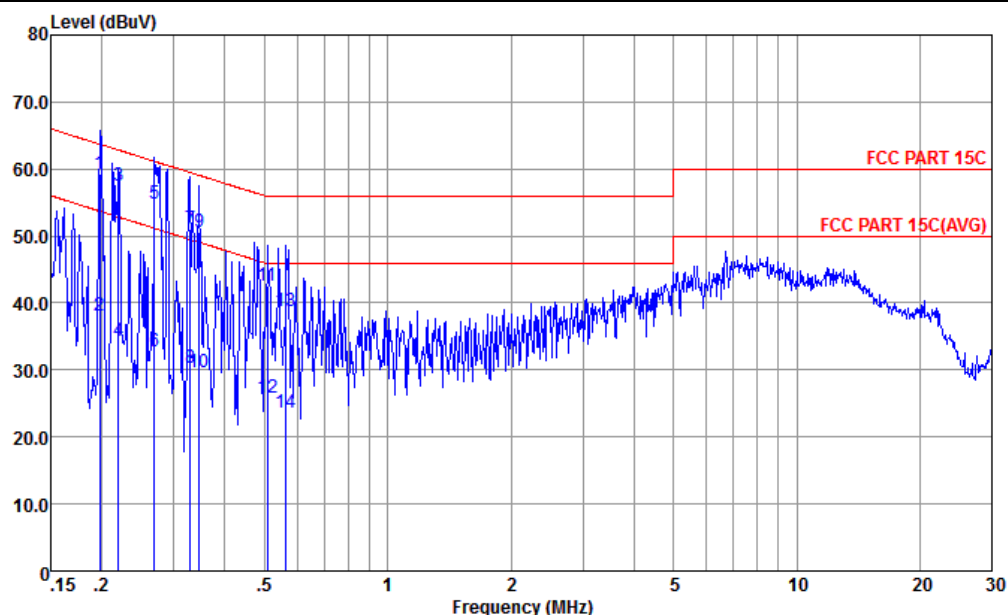
11N40SISO_Ant1_2452_1000~26500





Appendix B. AC Conducted Emission Test Results

Test Engineer :	Amos Zhang	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.		

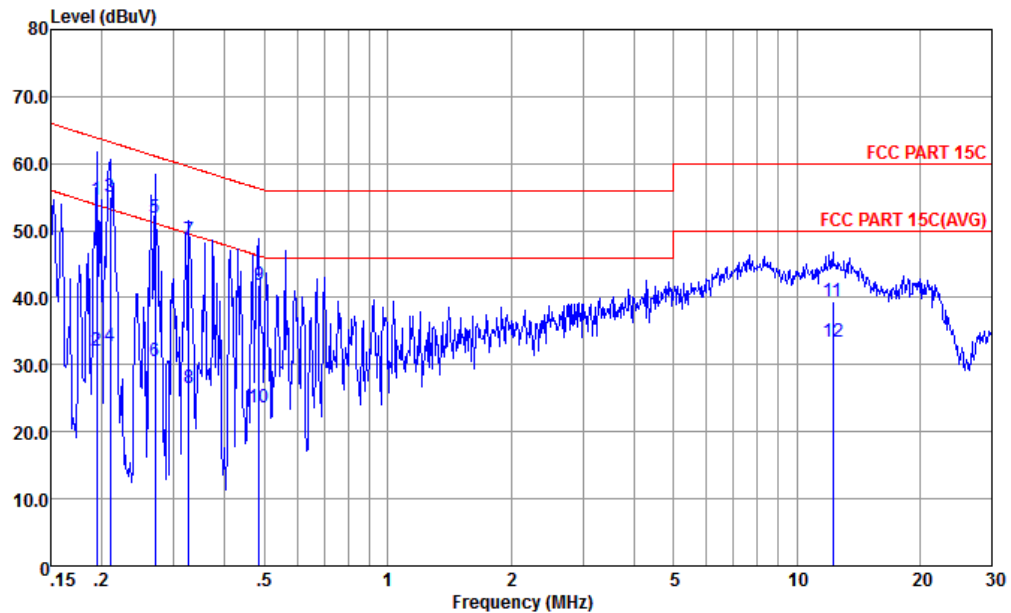


Site : CO01-KS
Condition : FCC PART 15C LISN-060105-L LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.198	59.31	-4.40	63.71	48.90	0.04	10.37	QP
2	0.198	38.01	-15.70	53.71	27.60	0.04	10.37	Average
3	0.220	57.50	-5.33	62.83	47.10	0.05	10.35	QP
4	0.220	34.30	-18.53	52.83	23.90	0.05	10.35	Average
5	0.269	54.88	-6.28	61.16	44.50	0.06	10.32	QP
6	0.269	32.68	-18.48	51.16	22.30	0.06	10.32	Average
7	0.329	50.97	-8.52	59.49	40.60	0.08	10.29	QP
8	0.329	30.27	-19.22	49.49	19.90	0.08	10.29	Average
9	0.346	50.57	-8.48	59.05	40.20	0.08	10.29	QP
10	0.346	29.67	-19.38	49.05	19.30	0.08	10.29	Average
11	0.507	42.54	-13.46	56.00	32.20	0.10	10.24	QP
12	0.507	25.84	-20.16	46.00	15.50	0.10	10.24	Average
13	0.564	38.84	-17.16	56.00	28.50	0.10	10.24	QP
14	0.564	23.64	-22.36	46.00	13.30	0.10	10.24	Average



Test Engineer :	Amos Zhang	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	dBμV	Limit	Line	Level	Factor	Loss	
			dB	dBμV	dBμV	dB	dB	
1	0.194	54.68	-9.16	63.84	44.21	0.10	10.37	QP
2	0.194	32.08	-21.76	53.84	21.61	0.10	10.37	Average
3 *	0.209	55.06	-8.17	63.23	44.60	0.10	10.36	QP
4	0.209	32.76	-20.47	53.23	22.30	0.10	10.36	Average
5	0.270	51.92	-9.20	61.12	41.50	0.10	10.32	QP
6	0.270	30.62	-20.50	51.12	20.20	0.10	10.32	Average
7	0.327	48.60	-10.93	59.53	38.21	0.10	10.29	QP
8	0.327	26.60	-22.93	49.53	16.21	0.10	10.29	Average
9	0.484	41.85	-14.42	56.27	31.50	0.11	10.24	QP
10	0.484	23.65	-22.62	46.27	13.30	0.11	10.24	Average
11	12.253	39.44	-20.56	60.00	28.80	0.27	10.37	QP
12	12.253	33.44	-16.56	50.00	22.80	0.27	10.37	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

Only the worst mode for 11b/g/n are reported.

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 11 2462MHz	*	2462	107.27	-	-	103.92	32.96	7.22	36.83	378	113	P	H
		2462	104.74	-	-	101.39	32.96	7.22	36.83	378	113	A	H
	*	2483.5	51.8	-22.2	74	48.39	32.98	7.25	36.82	378	113	P	H
		2483.5	44.36	-9.64	54	40.95	32.98	7.25	36.82	378	113	A	H
	*	2462	102.4	-	-	99.05	32.96	7.22	36.83	382	65	P	V
	*	2462	100.11	-	-	96.76	32.96	7.22	36.83	382	65	A	V
		2488.48	51.07	-22.93	74	47.63	33	7.25	36.81	382	65	P	V
		2483.5	42.53	-11.47	54	39.12	32.98	7.25	36.82	382	65	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 Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 11 2462MHz		4920	44.77	-29.23	74	65.62	34.26	10.34	65.45	300	0	P	H
		7380	42.94	-31.06	74	60.44	35.88	12.73	66.11	300	0	P	H
		4920	44.77	-29.23	74	65.62	34.26	10.34	65.45	100	0	P	V
		7380	41.84	-32.16	74	59.34	35.88	12.73	66.11	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 802.11g (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)
802.11g CH 01 2412MHz		2416	105.69	-	-	102.48	32.9	7.16	36.85	100	40	P	H
		2414	98.27	-	-	95.09	32.9	7.13	36.85	100	40	A	H
		2388.52	65.48	-8.52	74	62.36	32.88	7.1	36.86	100	40	P	H
		2389.69	50.76	-3.24	54	47.64	32.88	7.1	36.86	100	40	A	H
		2414	104.4	-	-	101.22	32.9	7.13	36.85	399	56	P	V
		2414	97.19	-	-	94.01	32.9	7.13	36.85	399	56	A	V
		2389.82	63.06	-10.94	74	59.94	32.88	7.1	36.86	399	56	P	V
		2389.95	49.19	-4.81	54	46.07	32.88	7.1	36.86	399	56	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 802.11g (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)
802.11g CH 01 2412MHz		4830	40.99	-33.01	74	61.92	34.2	10.25	65.38	300	0	P	H
		4830	40.67	-33.33	74	61.6	34.2	10.25	65.38	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		2389.82	67.91	-6.09	74	64.79	32.88	7.1	36.86	100	37	P	H
		2389.82	50.73	-3.27	54	47.61	32.88	7.1	36.86	100	37	A	H
	*	2420	100.37	-	-	97.14	32.92	7.16	36.85	100	37	P	H
	*	2416	93.12	-	-	89.91	32.9	7.16	36.85	100	37	A	H
		2493.82	52.28	-21.72	74	48.81	33	7.28	36.81	100	37	P	H
		2499.94	43.11	-10.89	54	39.64	33	7.28	36.81	100	37	A	H
		2389.82	63.44	-10.56	74	60.32	32.88	7.1	36.86	391	66	P	V
		2389.95	46.55	-7.45	54	43.43	32.88	7.1	36.86	391	66	A	V
	*	2424	99.07	-	-	95.84	32.92	7.16	36.85	391	66	P	V
	*	2424	92.11	-	-	88.88	32.92	7.16	36.85	391	66	A	V
		2499.94	49.41	-24.59	74	45.94	33	7.28	36.81	391	66	P	V
		2500	40.52	-13.48	54	37.05	33	7.28	36.81	391	66	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		4844	40.12	-33.88	74	61.05	34.21	10.25	65.39	300	0	P	H
		7266	42.11	-31.89	74	59.34	35.86	12.72	65.81	300	0	P	H
		4844	40.74	-33.26	74	61.67	34.21	10.25	65.39	100	0	P	V
		7266	42.29	-31.71	74	59.52	35.86	12.72	65.81	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 802.11g (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 802.11g LF		31.94	20.34	-19.66	40	28.07	24.46	0.71	32.9	-	-	P	H
		138.64	14.46	-29.04	43.5	27.85	17.64	1.79	32.82	-	-	P	H
		315.18	17.58	-28.42	46	27.21	20.57	2.7	32.9	-	-	P	H
		508.21	22.69	-23.31	46	27.29	24.72	3.45	32.77	-	-	P	H
		643.04	25.64	-20.36	46	28.59	25.85	3.87	32.67	-	-	P	H
		845.77	28.01	-17.99	46	28.98	27.18	4.44	32.59	-	-	P	H
		30	20.1	-19.9	40	26.59	25.5	0.71	32.7	-	-	P	V
		250.19	19.29	-26.71	46	30.57	19.4	2.42	33.1	-	-	P	V
		424.79	21.38	-24.62	46	27.84	23.15	3.14	32.75	-	-	P	V
		567.38	24.56	-21.44	46	27.73	25.76	3.64	32.57	-	-	P	V
		686.69	26.25	-19.75	46	29.26	25.75	4.01	32.77	-	-	P	V
		874.87	29.49	-16.51	46	30.22	27.3	4.52	32.55	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



<Simultaneous transmission>

2.4GHz 2400~2483.5MHz

WIFI 802.11g &EDGE850 (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		2389.82	66.46	-7.54	74	63.34	32.88	7.1	36.86	276	108	P	H
		2389.95	50.67	-3.33	54	47.55	32.88	7.1	36.86	276	108	A	H
		2414	106.76	---	---	103.58	32.9	7.13	36.85	276	108	P	H
		2414	99.51	---	---	96.33	32.9	7.13	36.85	276	108	A	H
		2389.95	61.97	-12.03	74	58.85	32.88	7.1	36.86	103	201	P	V
		2389.95	44.99	-9.01	54	41.87	32.88	7.1	36.86	103	201	A	V
		2410	101.21	--	--	98.03	32.9	7.13	36.85	103	201	P	V
		2412	93.42	--	--	90.24	32.9	7.13	36.85	103	201	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 802.11g (Harmonic @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		4830	40.72	-33.28	74	61.65	34.2	10.25	65.38	300	0	P	H
		4830	40.13	-33.87	74	61.06	34.2	10.25	65.38	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average 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:

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)

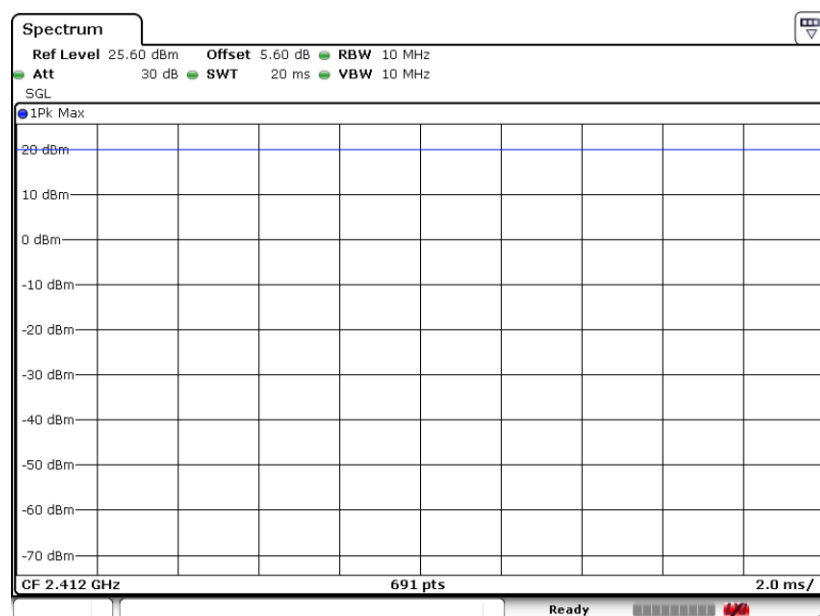
= -10.46(dB)

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

Appendix D. Duty Cycle Plots

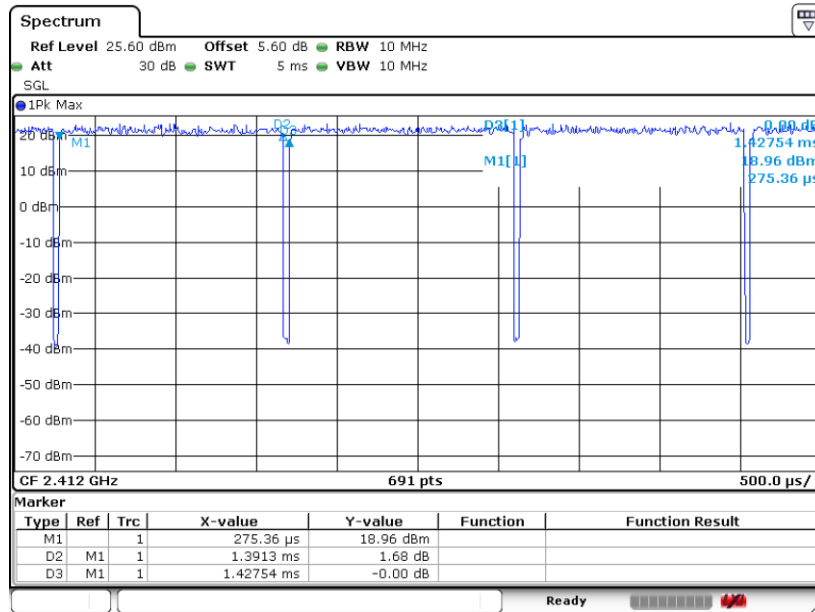
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	97.46	1.391	0.719	0.72KHz
802.11n HT20	97.30	1.304	0.767	0.82KHz
802.11n HT40	95.14	0.652	1.533	1.6KHz

802.11b



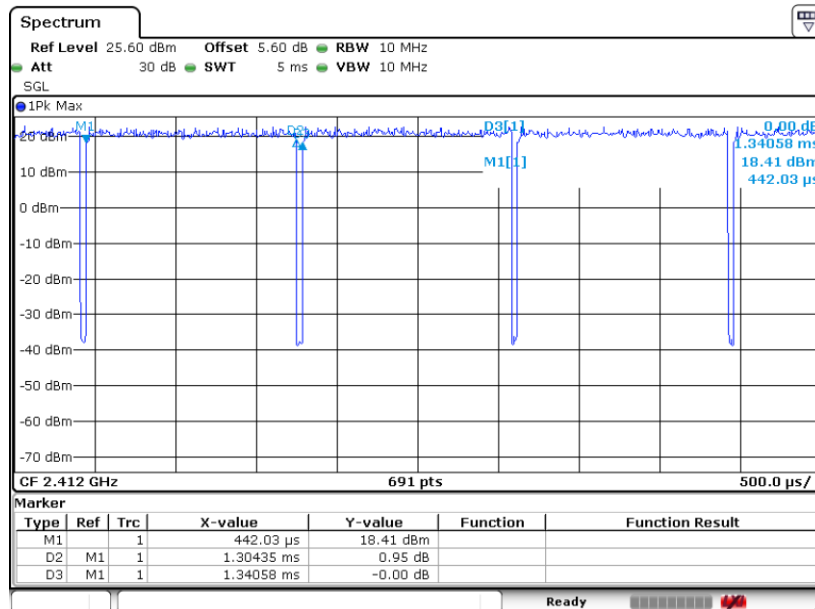
Date: 30 JUN 2022 00:27:25

802.11g



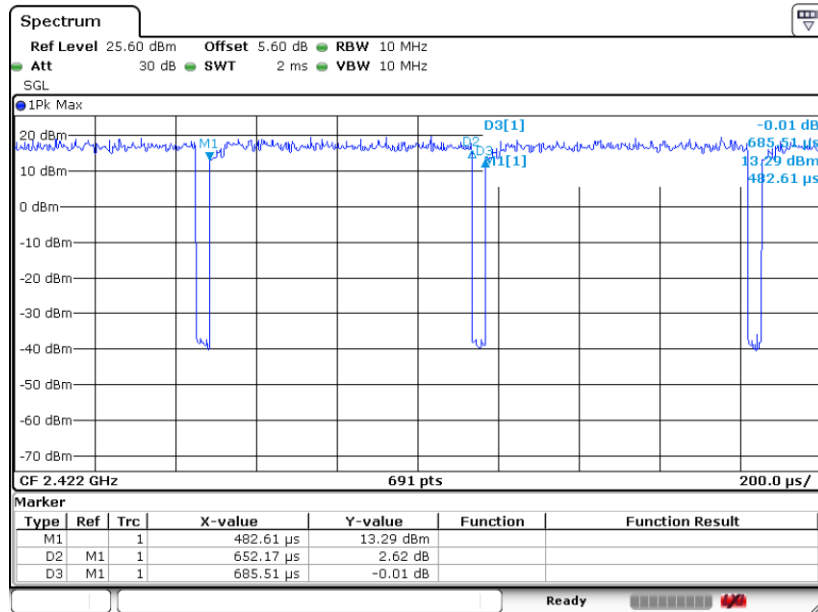
Date: 30 JUN 2022 00:28:41

802.11n HT20



Date: 30 JUN 2022 00:29:53

802.11n HT40



Date: 30 JUN 2022 00:31:37