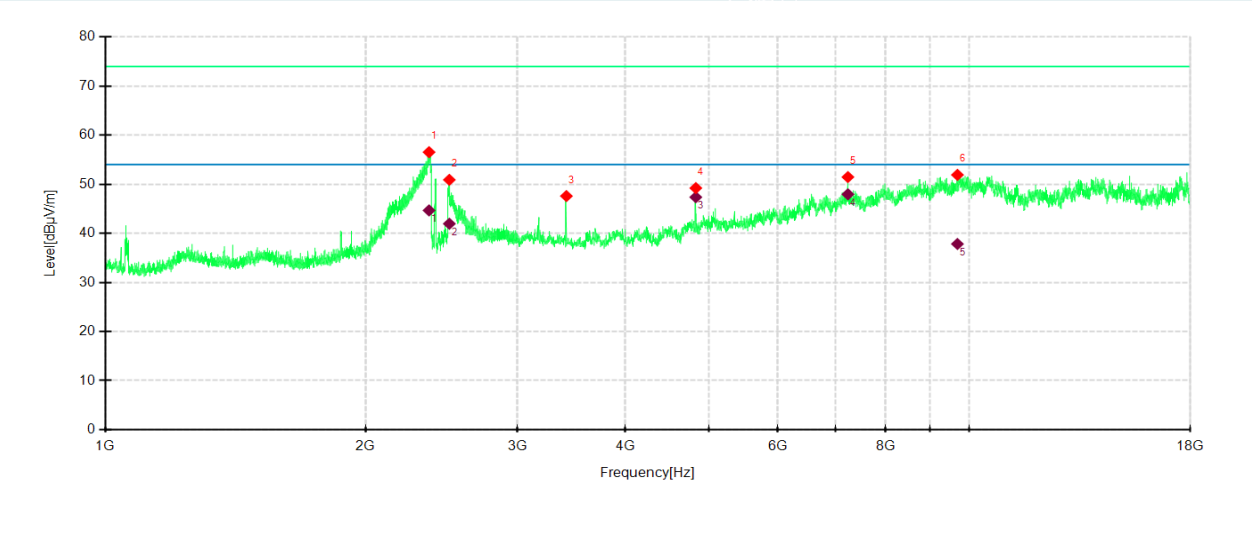


Mode: IEEE 802.11b (CDD)
Lowest Frequency (2412MHz)
Environment: 19.5°C/65%RH
Tested By:Zhang Zishan

Date: 2023-05-17
Voltage:AC120V/60Hz
/



NOTE:

(1) This plot is a test plot of the worst-case scenario in the 1GHz-18GHz mode.

----- The following blanks -----

18GHz-26.5GHz:

Pre-scan all modes and recorded the worst case results in this report (IEEE 802.11n HT20(SDM))

The peak test results is less than the average limits, so the average test results had not reported.

Mode: IEEE 802.11n HT20

Lowest Frequency (2412MHz)

Environment: 20.2°C/47%RH

Tested By:Zhang Zishan

Date: 2023-03-13

Voltage:AC120V/60Hz

/

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18895.05	54.08	42.21	-11.87	83.54	41.33	100	63	Horizontal
2	19018.3	53.21	41.43	-11.78	83.54	42.11	100	2	Horizontal
3	19720.4	52.88	41.65	-11.23	83.54	41.89	100	31	Horizontal
4	20147.95	52.89	41.97	-10.92	83.54	41.57	100	251	Horizontal
5	20561.475	51.96	41.52	-10.44	83.54	42.02	100	126	Horizontal
6	25079.65	48.68	41.47	-7.21	83.54	42.07	100	267	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18994.5	53.81	42.01	-11.80	83.54	41.53	100	139	Vertical
2	19598.425	52.74	41.47	-11.27	83.54	42.07	100	60	Vertical
3	20120.325	52.57	41.73	-10.84	83.54	41.81	100	232	Vertical
4	23034.125	50.14	41.51	-8.63	83.54	42.03	100	125	Vertical
5	25138.725	48.51	41.46	-7.05	83.54	42.08	100	30	Vertical
6	26366.975	48.77	41.70	-7.07	83.54	41.84	100	218	Vertical

Note:

Above 18G test distance is 1m, so the Peak Limit= $74+20*\log(3/1)=83.54$ (dBμV/m).

The pre measurement result margin is greater than 20dB, and final measurement is not required.

----- The following blanks -----

Mode: IEEE 802.11n HT20
MiddleFrequency (2437MHz)
Environment: 20.2°C/47%RH
Tested By:Zhang Zishan

Date: 2023-03-13
Voltage:AC120V/60Hz
/

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18946.475	52.41	40.58	-11.83	83.54	42.96	100	186	Horizontal
2	19249.5	52.92	41.32	-11.60	83.54	42.22	100	313	Horizontal
3	20132.65	51.54	40.61	-10.93	83.54	42.93	100	92	Horizontal
4	20606.525	51.04	40.64	-10.40	83.54	42.90	100	313	Horizontal
5	21047.25	51.39	41.30	-10.09	83.54	42.24	100	266	Horizontal
6	25166.775	47.31	40.19	-7.12	83.54	43.35	100	266	Horizontal

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	18937.55	52.67	40.83	-11.84	83.54	42.71	100	31	Vertical
2	19812.625	52.07	40.99	-11.08	83.54	42.55	100	139	Vertical
3	20596.325	51.12	40.85	-10.27	83.54	42.69	100	311	Vertical
4	21638.425	51.08	41.42	-9.66	83.54	42.12	100	233	Vertical
5	22627.825	49.91	40.94	-8.97	83.54	42.60	100	92	Vertical
6	25114.5	48.37	41.29	-7.08	83.54	42.25	100	139	Vertical

Note:
Above 18G test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dBμV/m).
The pre measurement result margin is greater than 20dB, and final measurement is not required.

----- The following blanks -----

Mode: IEEE 802.11n HT20
Highest Frequency (2462MHz)
Environment: 20.2°C/47%RH
Tested By:Zhang Zishan

Date: 2023-03-13
Voltage:AC120V/60Hz
/

Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	19415.675	52.90	41.41	-11.49	83.54	42.13	100	0	Horizontal
2	20127.975	52.52	41.58	-10.94	83.54	41.96	100	25	Horizontal
3	20207.875	52.56	41.70	-10.86	83.54	41.84	100	152	Horizontal
4	21156.9	51.90	41.83	-10.07	83.54	41.71	100	231	Horizontal
5	21286.1	51.33	41.35	-9.98	83.54	42.19	100	168	Horizontal
6	26361.45	48.51	41.28	-7.23	83.54	42.26	100	185	Horizontal

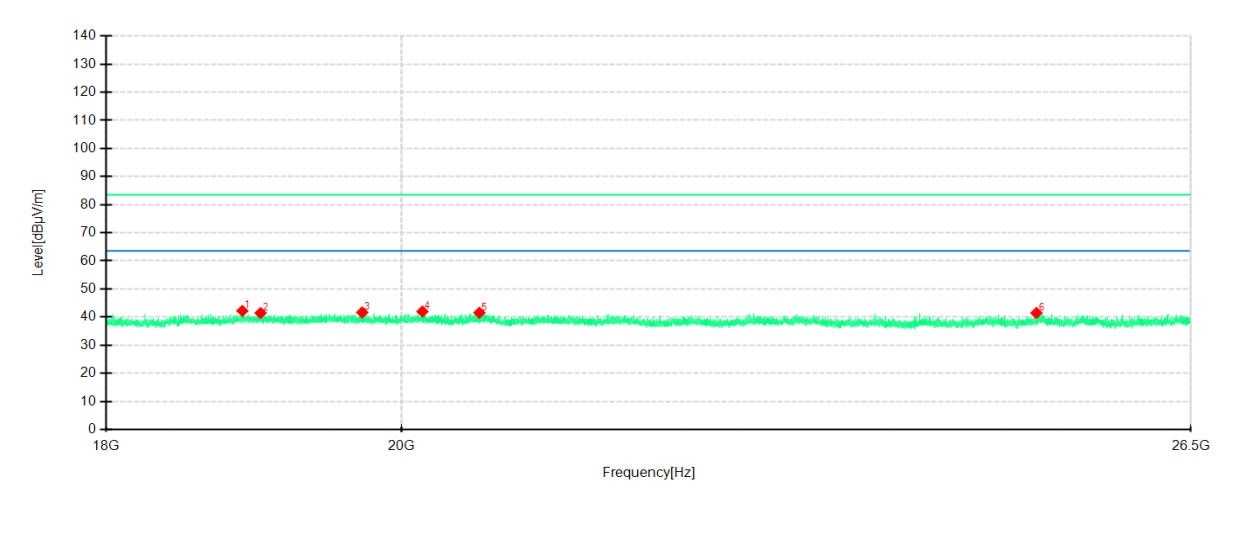
Suspected Data List									
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	19475.6	53.23	41.79	-11.44	83.54	41.75	100	253	Vertical
2	19692.775	52.43	41.26	-11.17	83.54	42.28	100	111	Vertical
3	20524.075	52.53	42.17	-10.36	83.54	41.37	100	286	Vertical
4	21536.425	51.05	41.33	-9.72	83.54	42.21	100	65	Vertical
5	25128.1	48.57	41.51	-7.06	83.54	42.03	100	96	Vertical
6	25490.625	48.84	41.47	-7.37	83.54	42.07	100	223	Vertical

Note:
Above 18G test distance is 1m, so the Peak Limit=74+20*log(3/1)=83.54 (dBμV/m).
The pre measurement result margin is greater than 20dB, and final measurement is not required.

----- The following blanks -----

Mode: IEEE 802.11n HT20
Lowest Frequency (2412MHz)
Environment: 20.2°C/47%RH
Tested By:Zhang Zishan

Date: 2023-03-13
Voltage:AC120V/60Hz
/



NOTE:
This plot is a test plot of the worst-case scenario in the 18GHz-26.5GHz mode.

----- The following blanks -----

7. 6DB BANDWIDTH

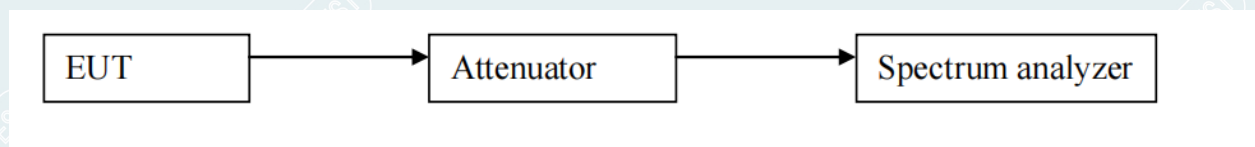
7.1. LIMITS

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.2. TEST PROCEDURES

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- 2) Set resolution bandwidth (RBW) = 100kHz. Set the video bandwidth (VBW) $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize, record 6dB bandwidth value.
- 3) Repeat above procedures until all frequencies measured were complete.

7.3. TEST SETUP



----- The following blanks -----

7.4. TEST RESULTS

Environment: 22.5°C/54%RH/101.0kPa

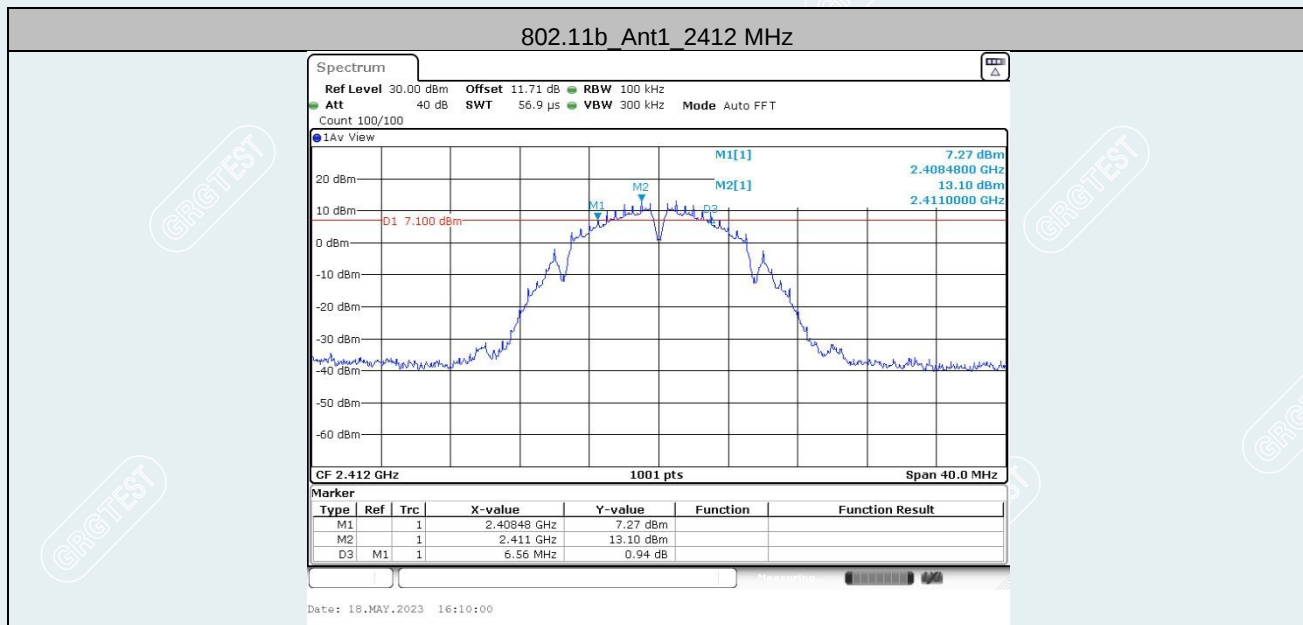
Voltage: AC120V/60Hz

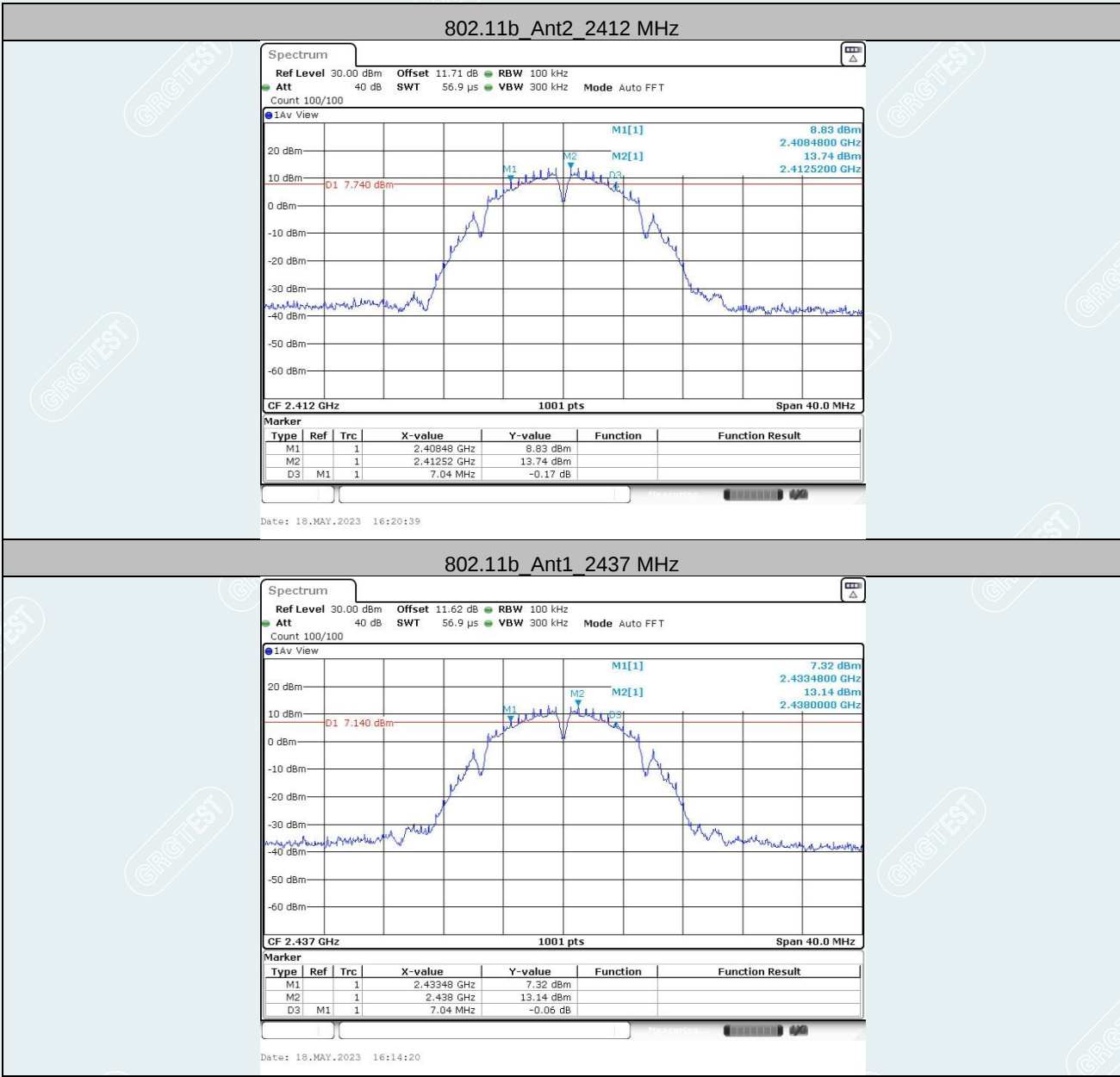
Tested By: Huang Tianmei

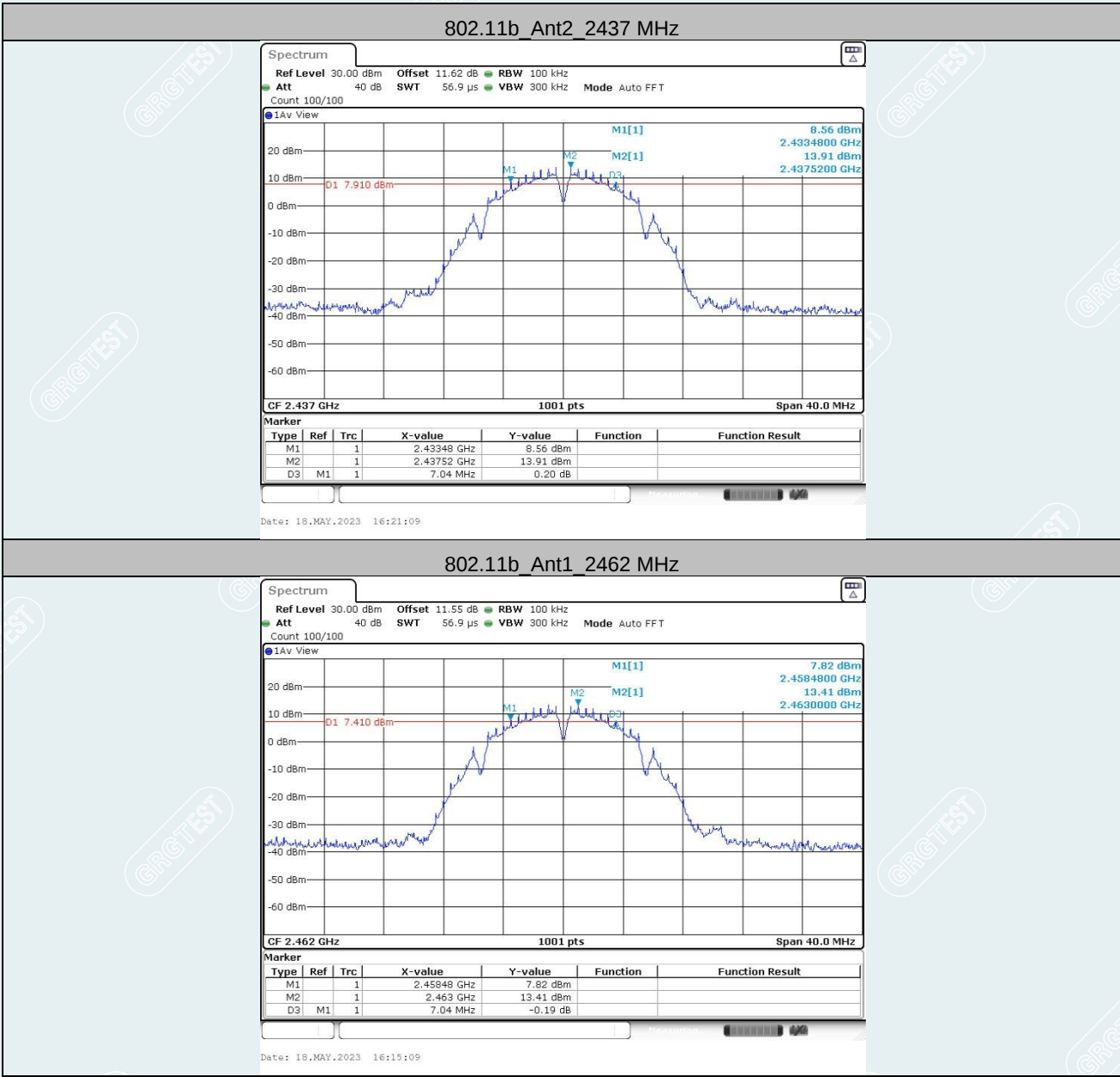
Date: 2023-05-18

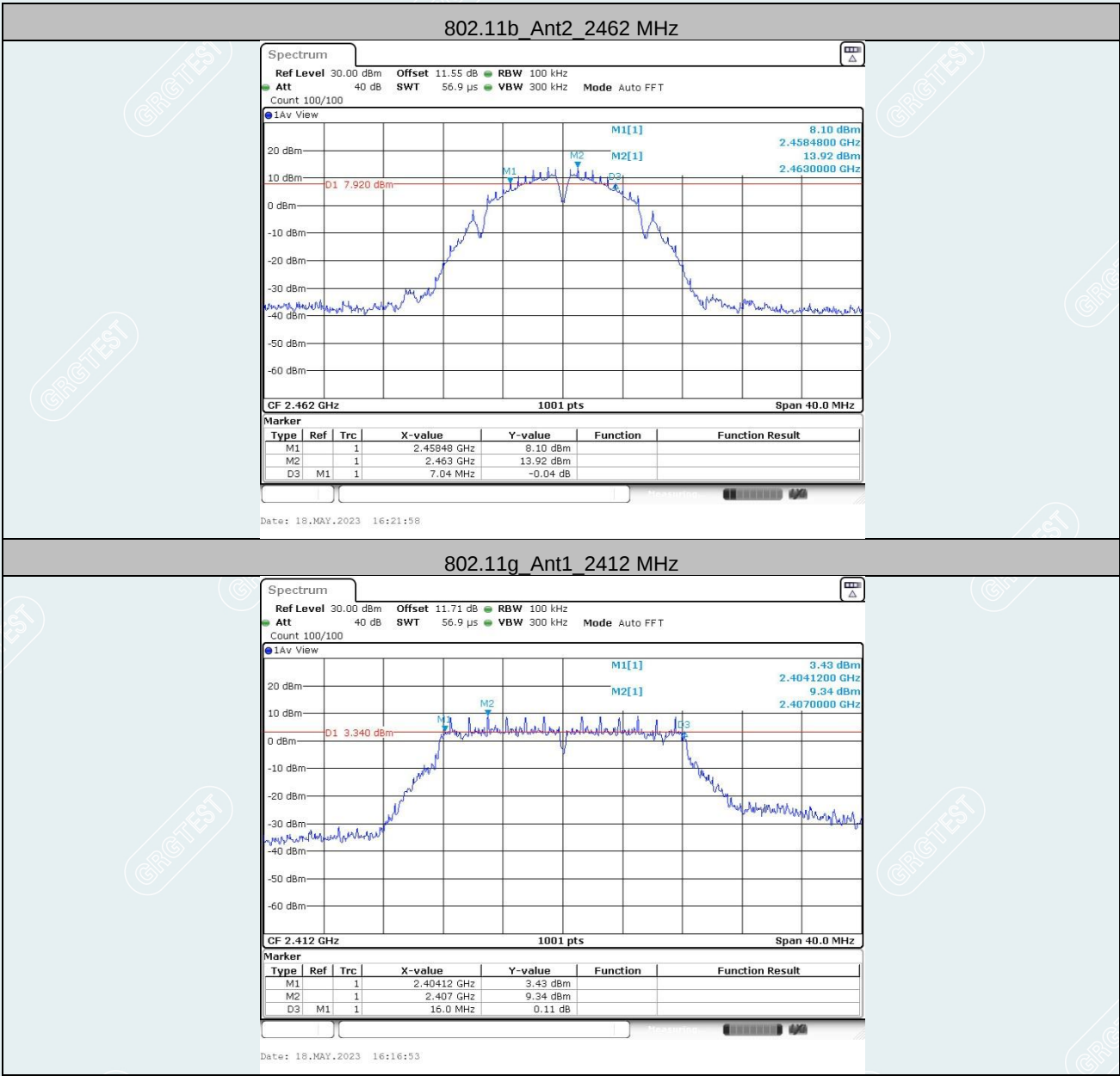
SISO

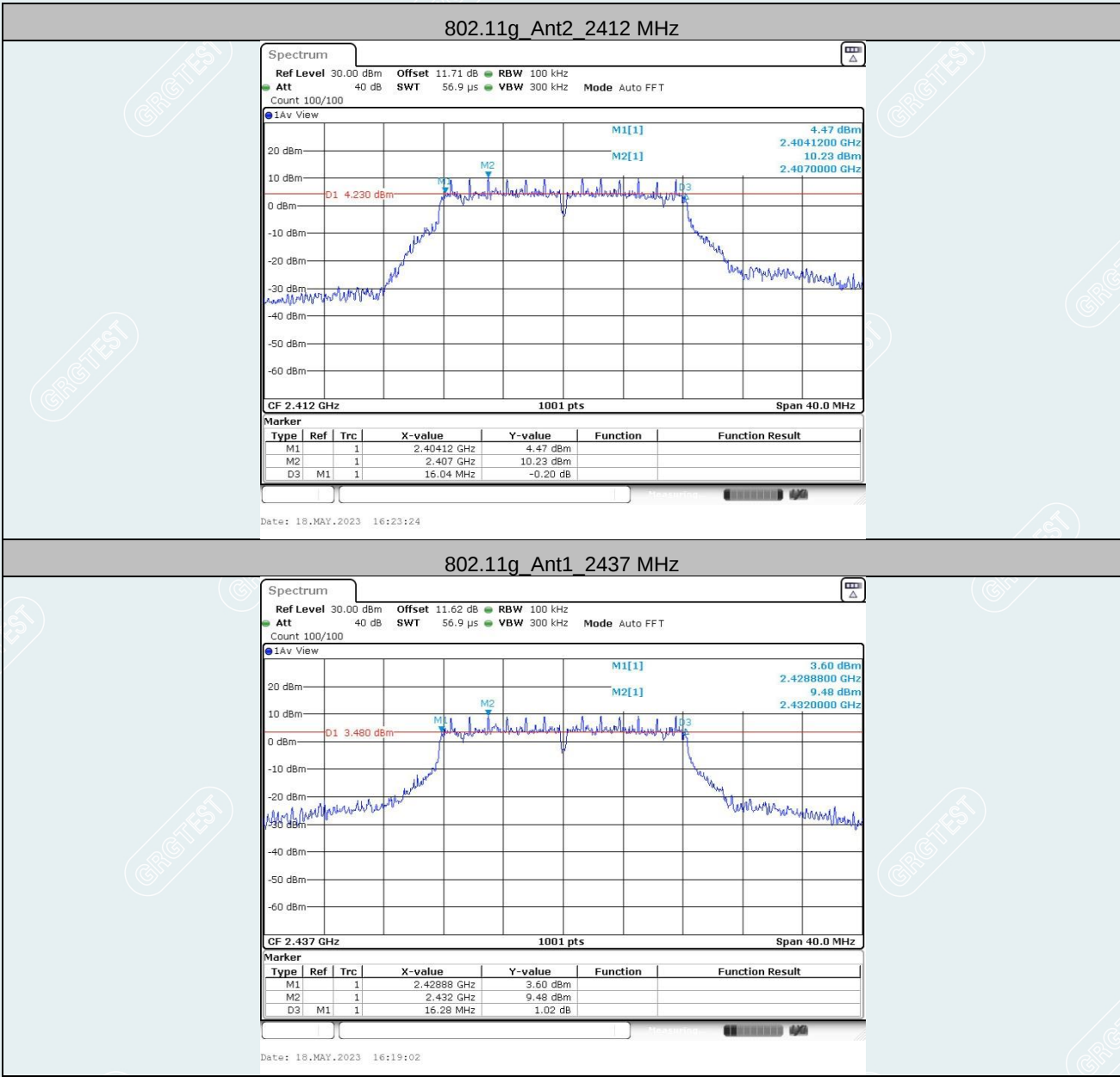
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	F _L [MHz]	F _H [MHz]	Limit[MHz]	Verdict
802.11b	Ant1	2412	6.56	2408.48	2415.04	≥0.5	PASS
	Ant2	2412	7.04	2408.48	2415.52	≥0.5	PASS
	Ant1	2437	7.04	2433.48	2440.52	≥0.5	PASS
	Ant2	2437	7.04	2433.48	2440.52	≥0.5	PASS
	Ant1	2462	7.04	2458.48	2465.52	≥0.5	PASS
	Ant2	2462	7.04	2458.48	2465.52	≥0.5	PASS
802.11g	Ant1	2412	16.00	2404.12	2420.12	≥0.5	PASS
	Ant2	2412	16.04	2404.12	2420.16	≥0.5	PASS
	Ant1	2437	16.28	2428.88	2445.16	≥0.5	PASS
	Ant2	2437	16.28	2428.88	2445.16	≥0.5	PASS
	Ant1	2462	16.04	2454.12	2470.16	≥0.5	PASS
	Ant2	2462	16.04	2454.12	2470.16	≥0.5	PASS

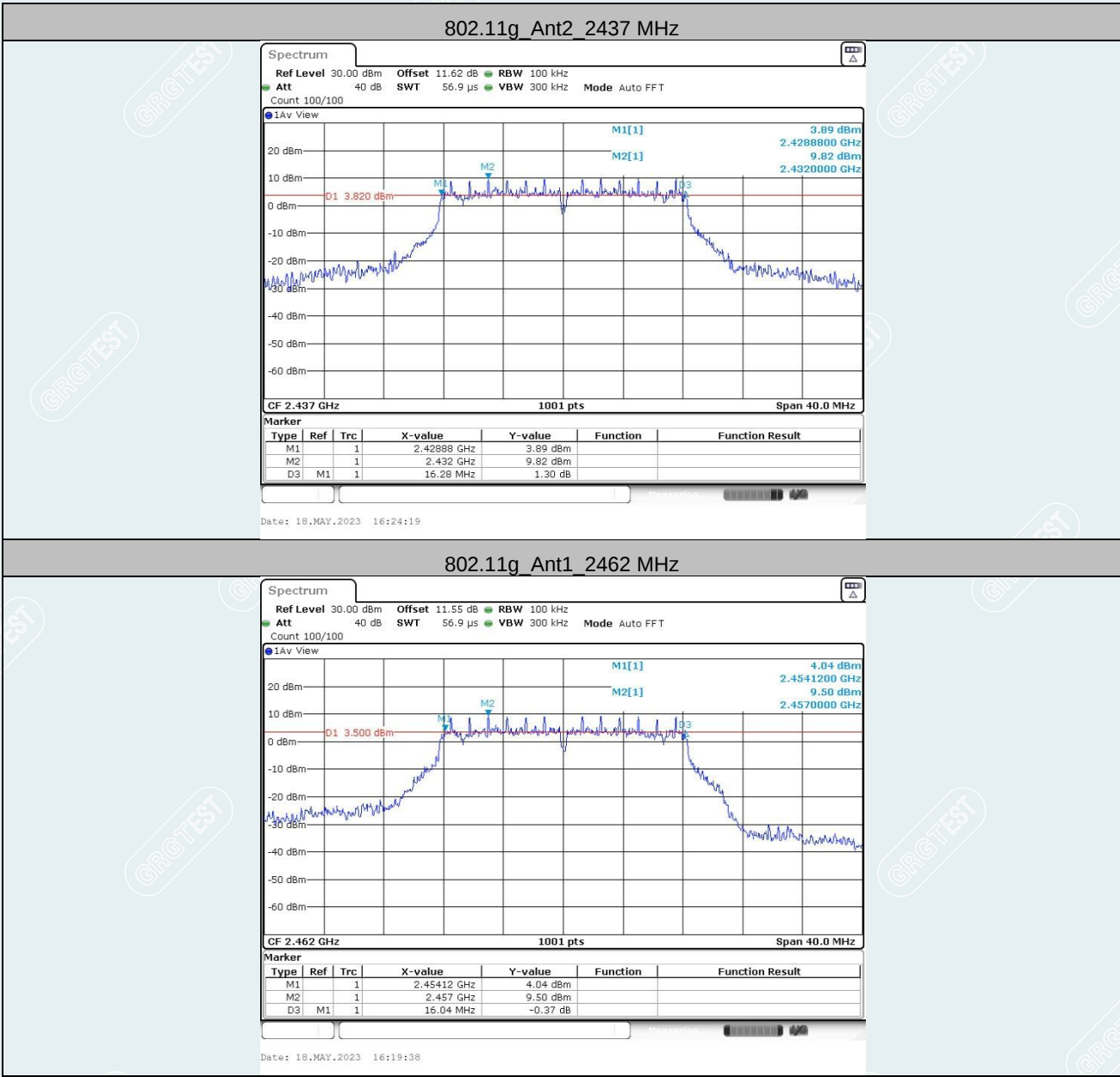


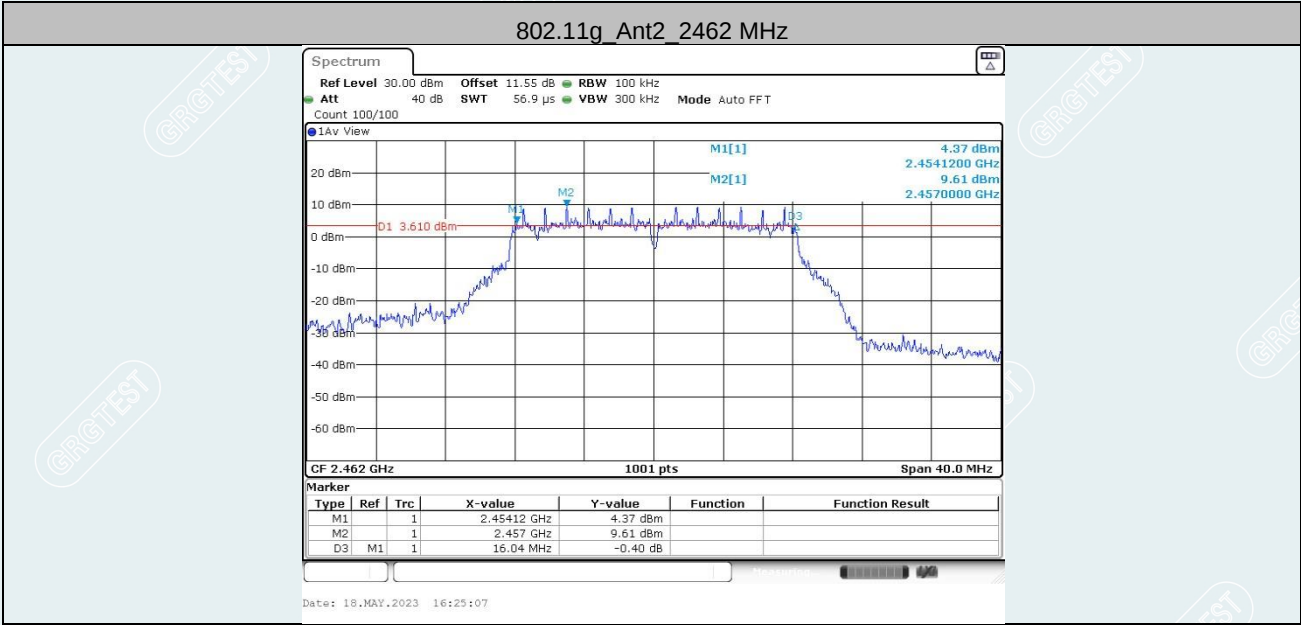








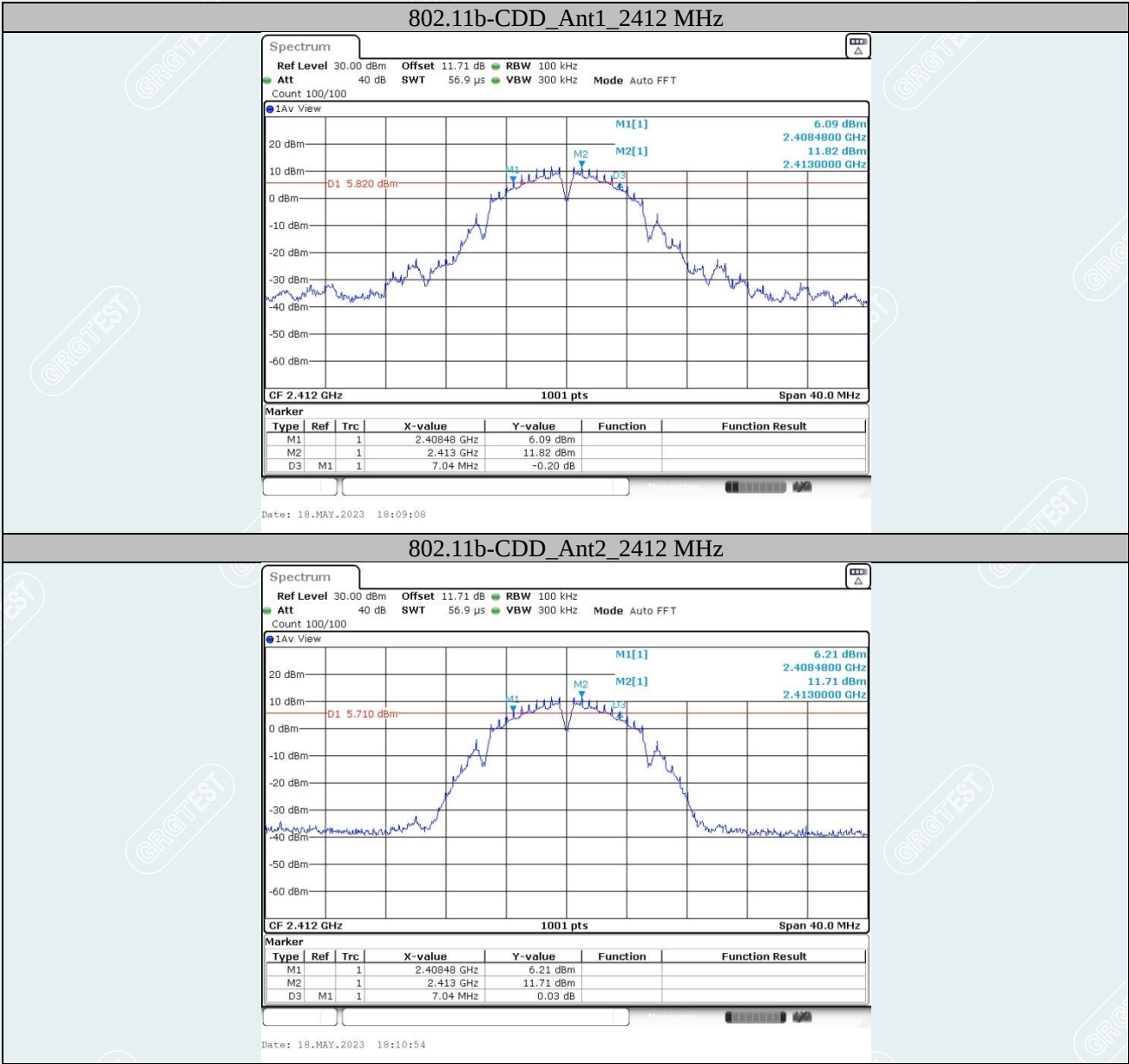


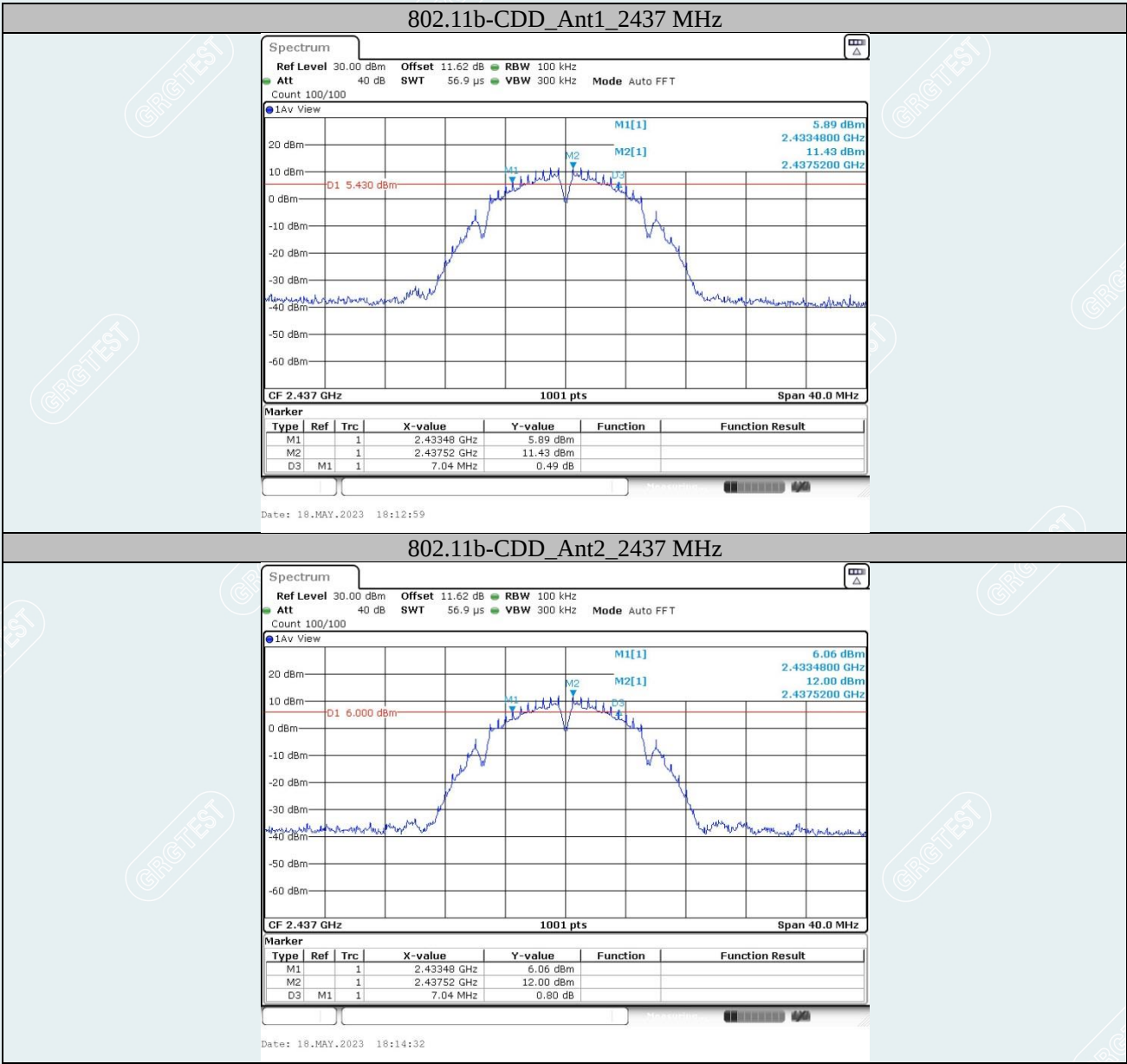


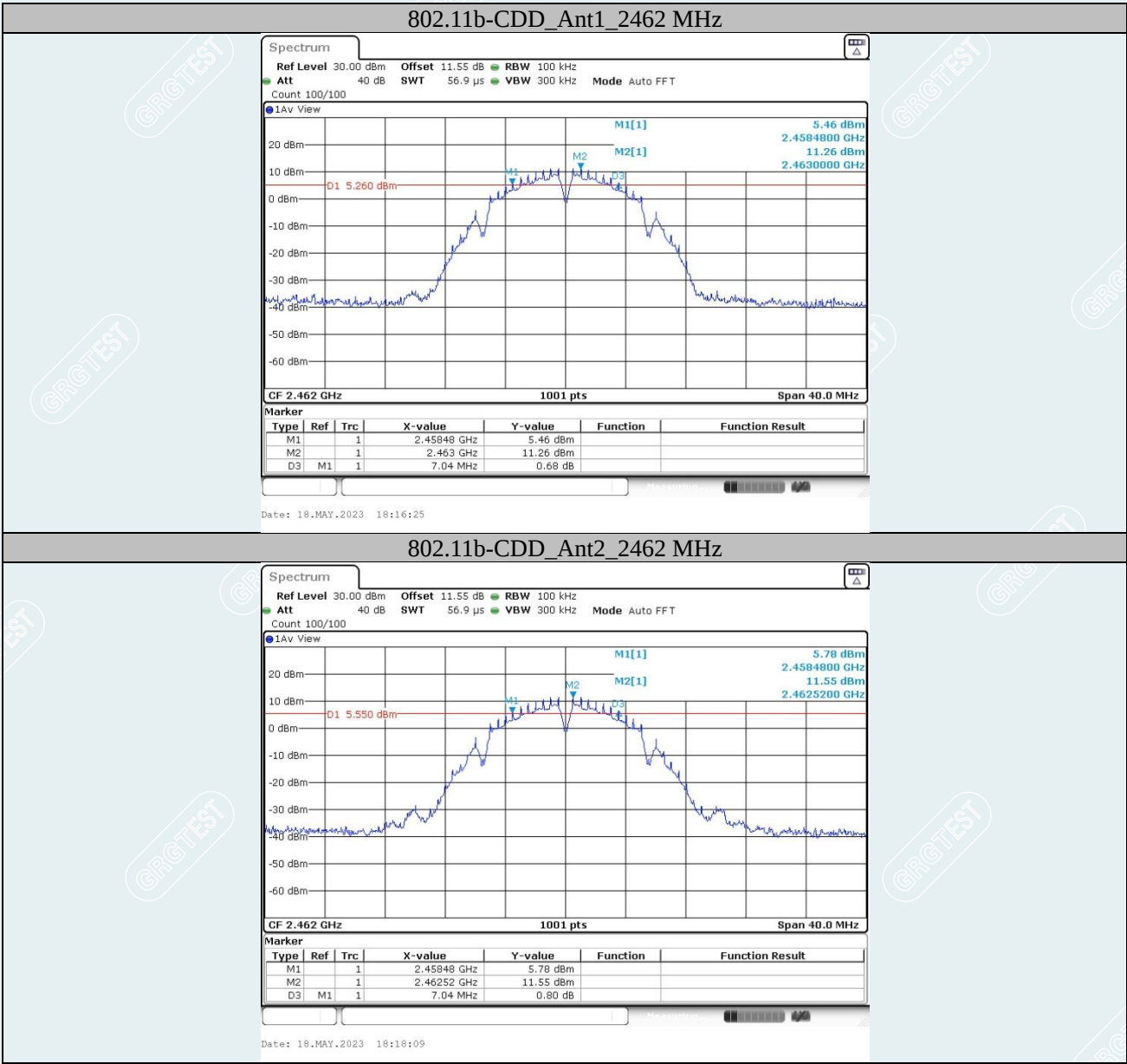
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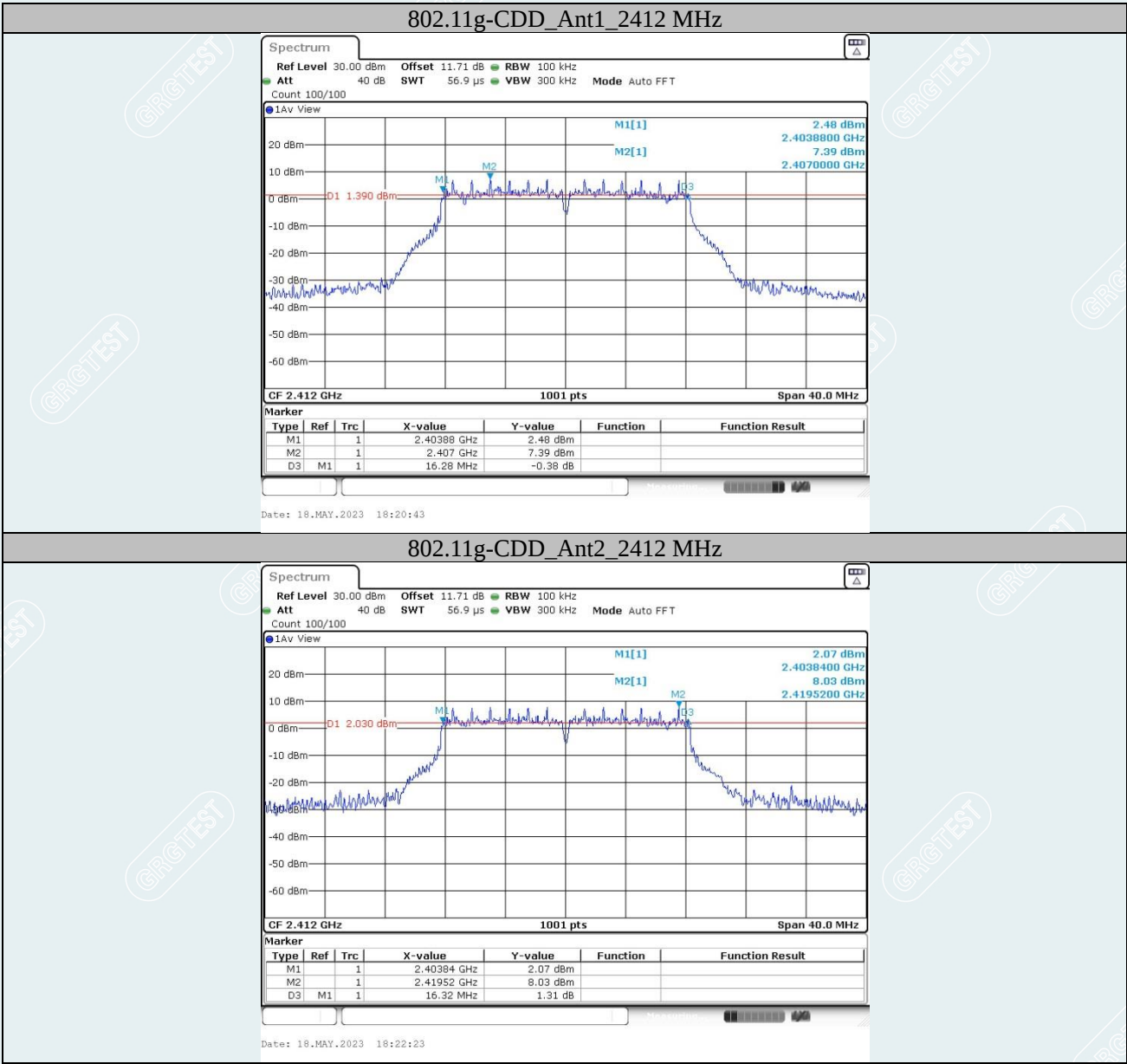
CDD

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	F _L [MHz]	F _H [MHz]	Limit[MHz]	Verdict
802.11b-CDD	Ant1	2412	7.04	2408.48	2415.52	≥0.5	PASS
	Ant2	2412	7.04	2408.48	2415.52	≥0.5	PASS
	Ant1	2437	7.04	2433.48	2440.52	≥0.5	PASS
	Ant2	2437	7.04	2433.48	2440.52	≥0.5	PASS
	Ant1	2462	7.04	2458.48	2465.52	≥0.5	PASS
	Ant2	2462	7.04	2458.48	2465.52	≥0.5	PASS
802.11g-CDD	Ant1	2412	16.28	2403.88	2420.16	≥0.5	PASS
	Ant2	2412	16.32	2403.84	2420.16	≥0.5	PASS
	Ant1	2437	16.28	2428.88	2445.16	≥0.5	PASS
	Ant2	2437	16.28	2428.88	2445.16	≥0.5	PASS
	Ant1	2462	16.28	2453.88	2470.16	≥0.5	PASS
	Ant2	2462	16.28	2453.88	2470.16	≥0.5	PASS
802.11n HT20 MIMO	Ant1	2412	17.56	2403.24	2420.80	≥0.5	PASS
	Ant2	2412	17.56	2403.24	2420.80	≥0.5	PASS
	Ant1	2437	17.56	2428.24	2445.80	≥0.5	PASS
	Ant2	2437	17.56	2428.24	2445.80	≥0.5	PASS
	Ant1	2462	17.56	2453.24	2470.80	≥0.5	PASS
	Ant2	2462	17.56	2453.24	2470.80	≥0.5	PASS
802.11n HT40 MIMO	Ant1	2422	35.76	2404.16	2439.92	≥0.5	PASS
	Ant2	2422	36.32	2403.84	2440.16	≥0.5	PASS
	Ant1	2437	36.32	2418.84	2455.16	≥0.5	PASS
	Ant2	2437	36.32	2418.84	2455.16	≥0.5	PASS
	Ant1	2452	35.68	2434.24	2469.92	≥0.5	PASS
	Ant2	2452	36.32	2433.84	2470.16	≥0.5	PASS
VHT20 MIMO	Ant1	2412	17.56	2403.24	2420.80	≥0.5	PASS
	Ant2	2412	17.56	2403.24	2420.80	≥0.5	PASS
	Ant1	2437	17.56	2428.24	2445.80	≥0.5	PASS
	Ant2	2437	17.56	2428.24	2445.80	≥0.5	PASS
	Ant1	2462	17.56	2453.24	2470.80	≥0.5	PASS
	Ant2	2462	17.56	2453.24	2470.80	≥0.5	PASS
AC40MIMO	Ant1	2422	36.08	2403.84	2439.92	≥0.5	PASS
	Ant2	2422	36.32	2403.84	2440.16	≥0.5	PASS
	Ant1	2437	36.32	2418.84	2455.16	≥0.5	PASS
	Ant2	2437	36.32	2418.84	2455.16	≥0.5	PASS
	Ant1	2452	36.00	2434.16	2470.16	≥0.5	PASS
	Ant2	2452	36.32	2433.84	2470.16	≥0.5	PASS
802.11ax HE20 MIMO	Ant1	2412	18.80	2402.60	2421.40	≥0.5	PASS
	Ant2	2412	18.92	2402.56	2421.48	≥0.5	PASS
	Ant1	2437	18.84	2427.60	2446.44	≥0.5	PASS
	Ant2	2437	18.88	2427.56	2446.44	≥0.5	PASS
	Ant1	2462	18.84	2452.60	2471.44	≥0.5	PASS
	Ant2	2462	18.84	2452.60	2471.44	≥0.5	PASS
802.11ax HE40 MIMO	Ant1	2422	36.80	2403.20	2440.00	≥0.5	PASS
	Ant2	2422	37.36	2403.12	2440.48	≥0.5	PASS
	Ant1	2437	37.60	2418.20	2455.80	≥0.5	PASS
	Ant2	2437	37.20	2418.28	2455.48	≥0.5	PASS
	Ant1	2452	37.60	2433.20	2470.80	≥0.5	PASS
	Ant2	2452	37.20	2433.28	2470.48	≥0.5	PASS

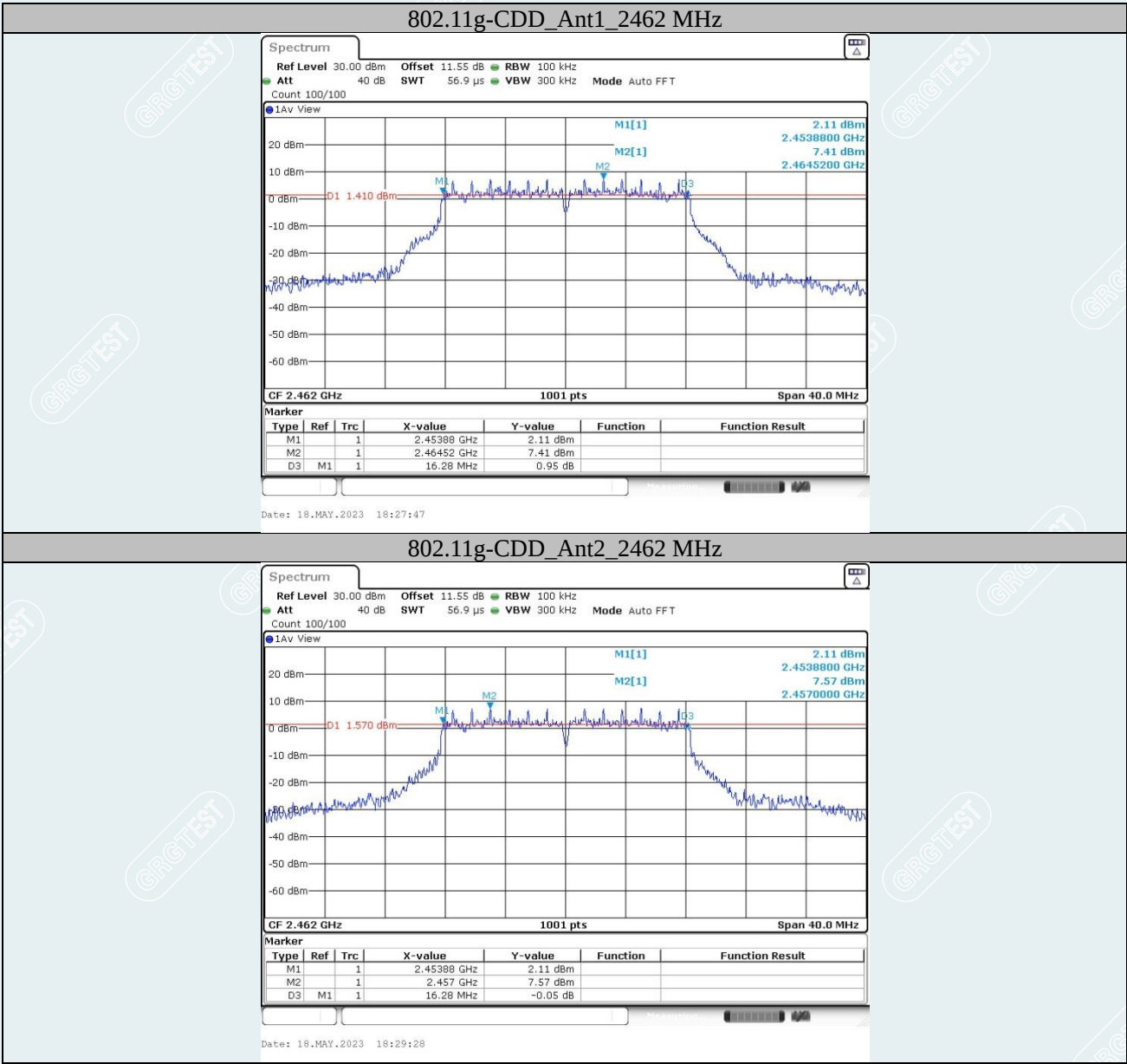


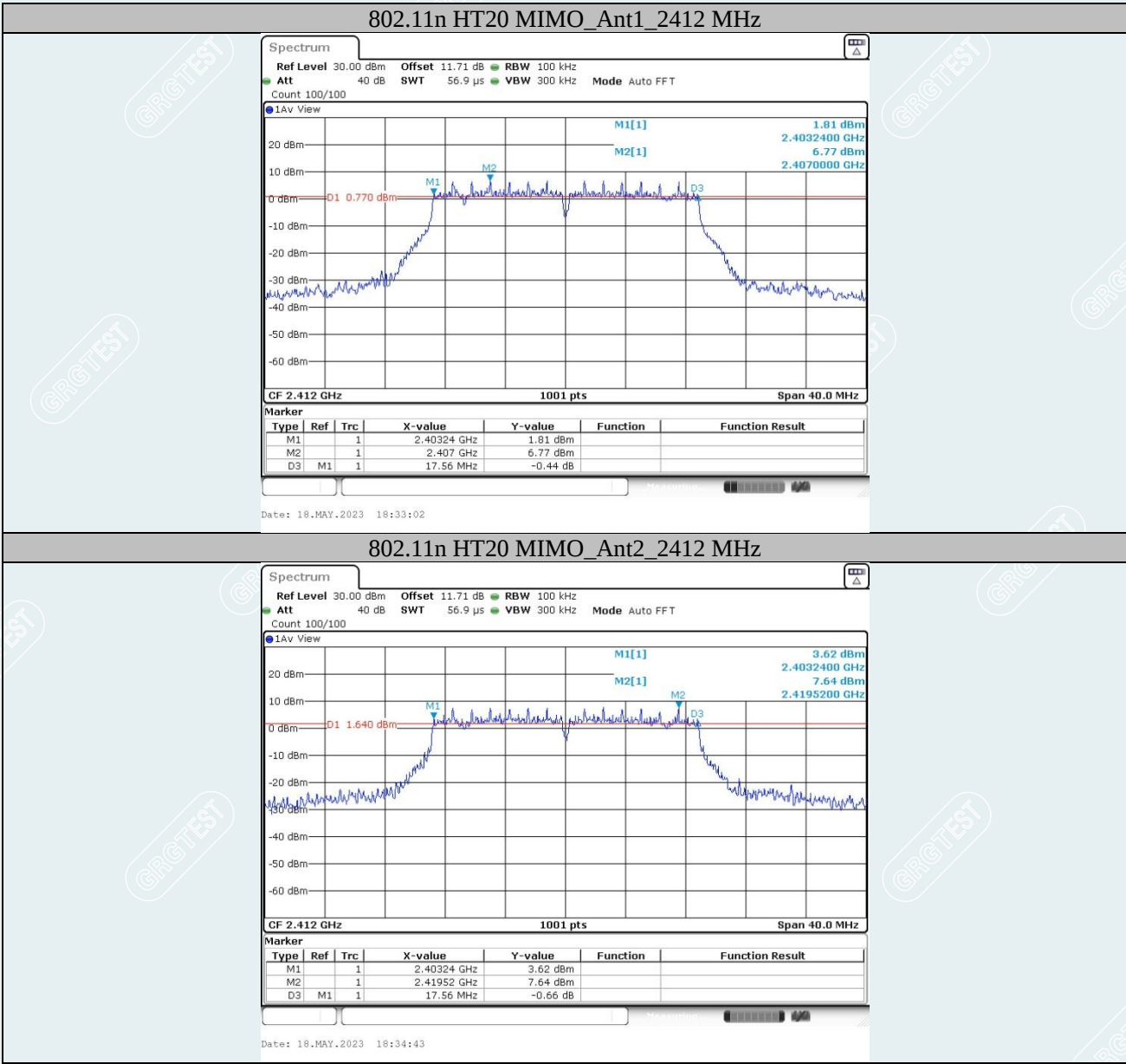


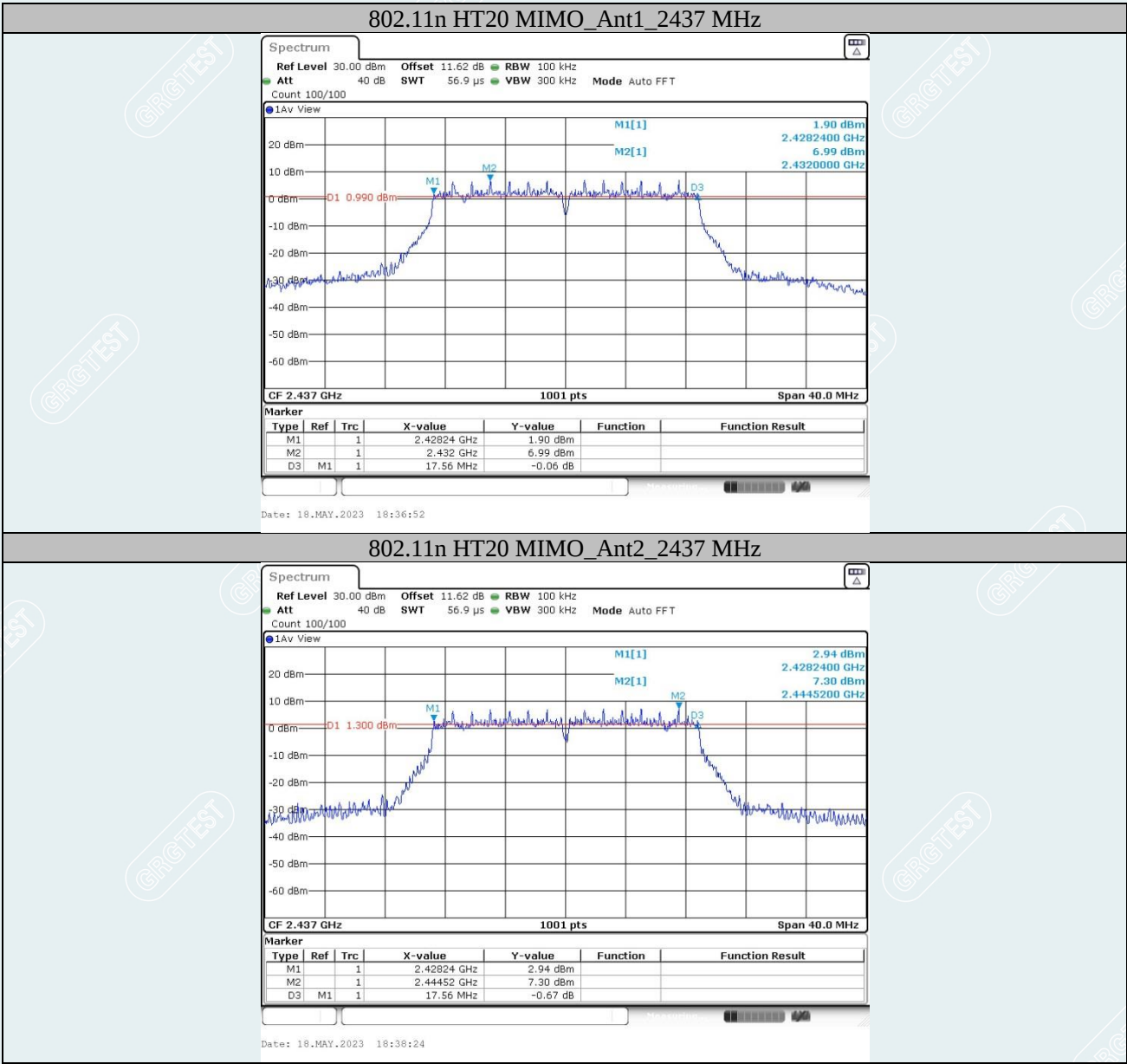


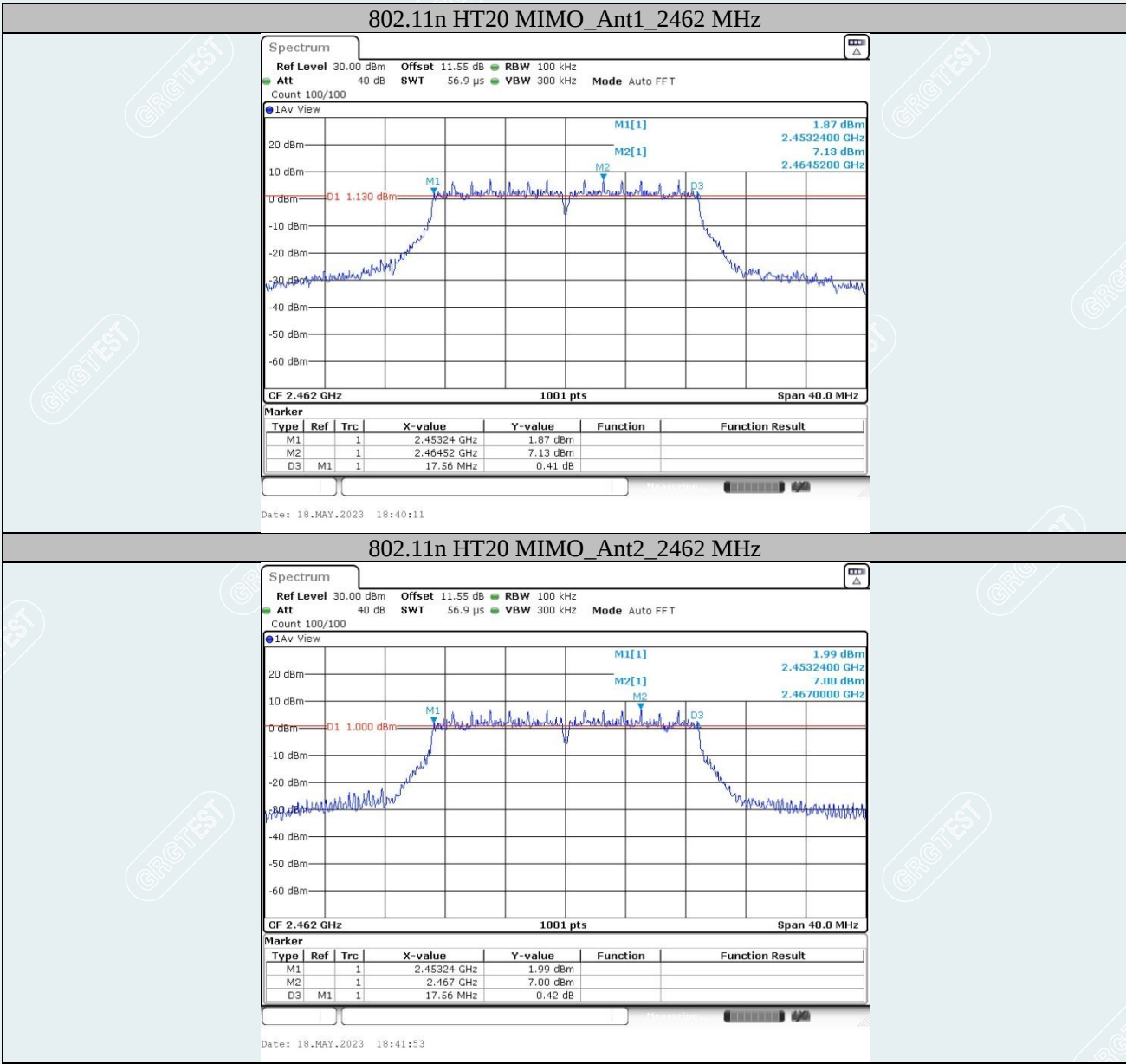


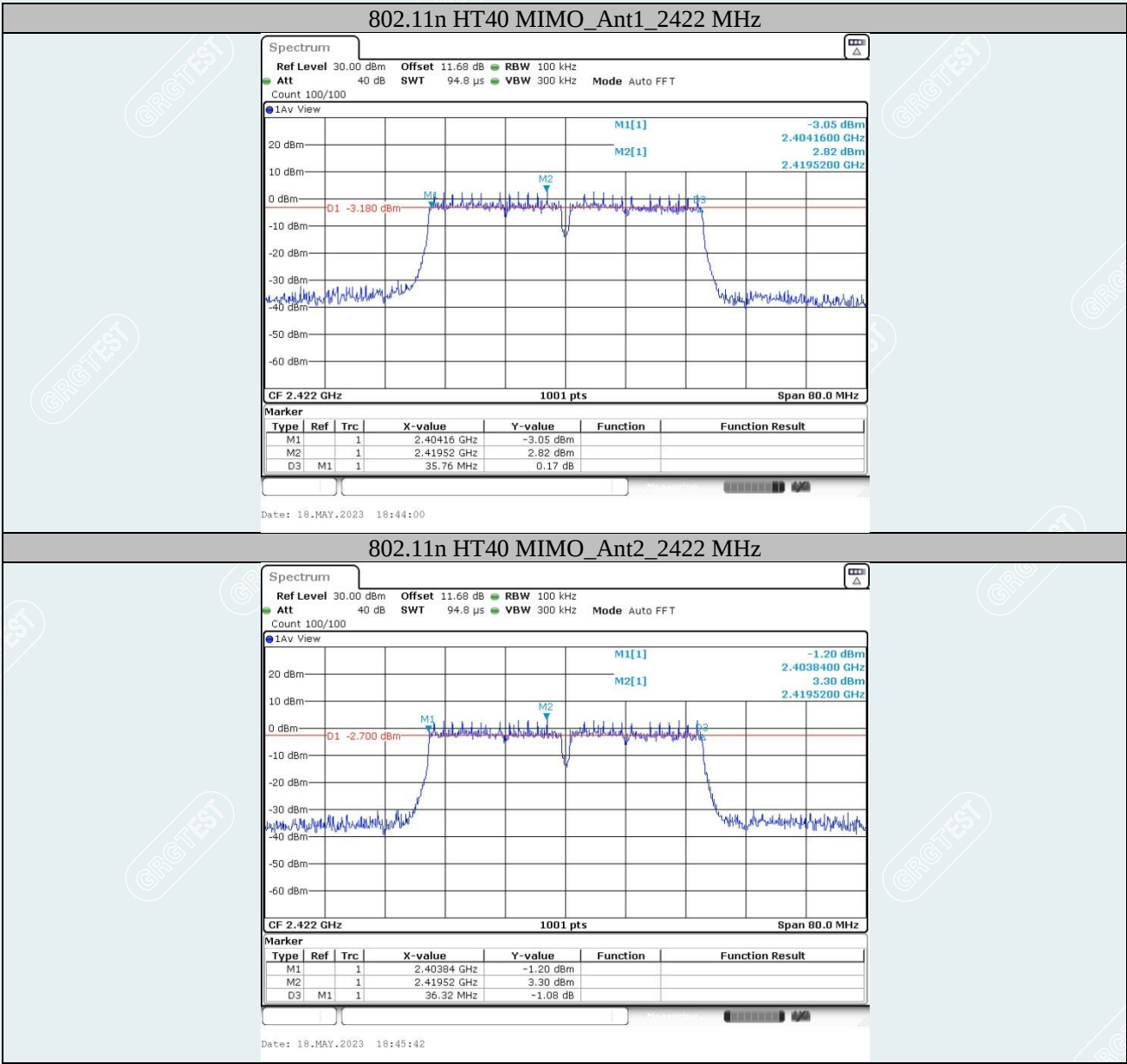


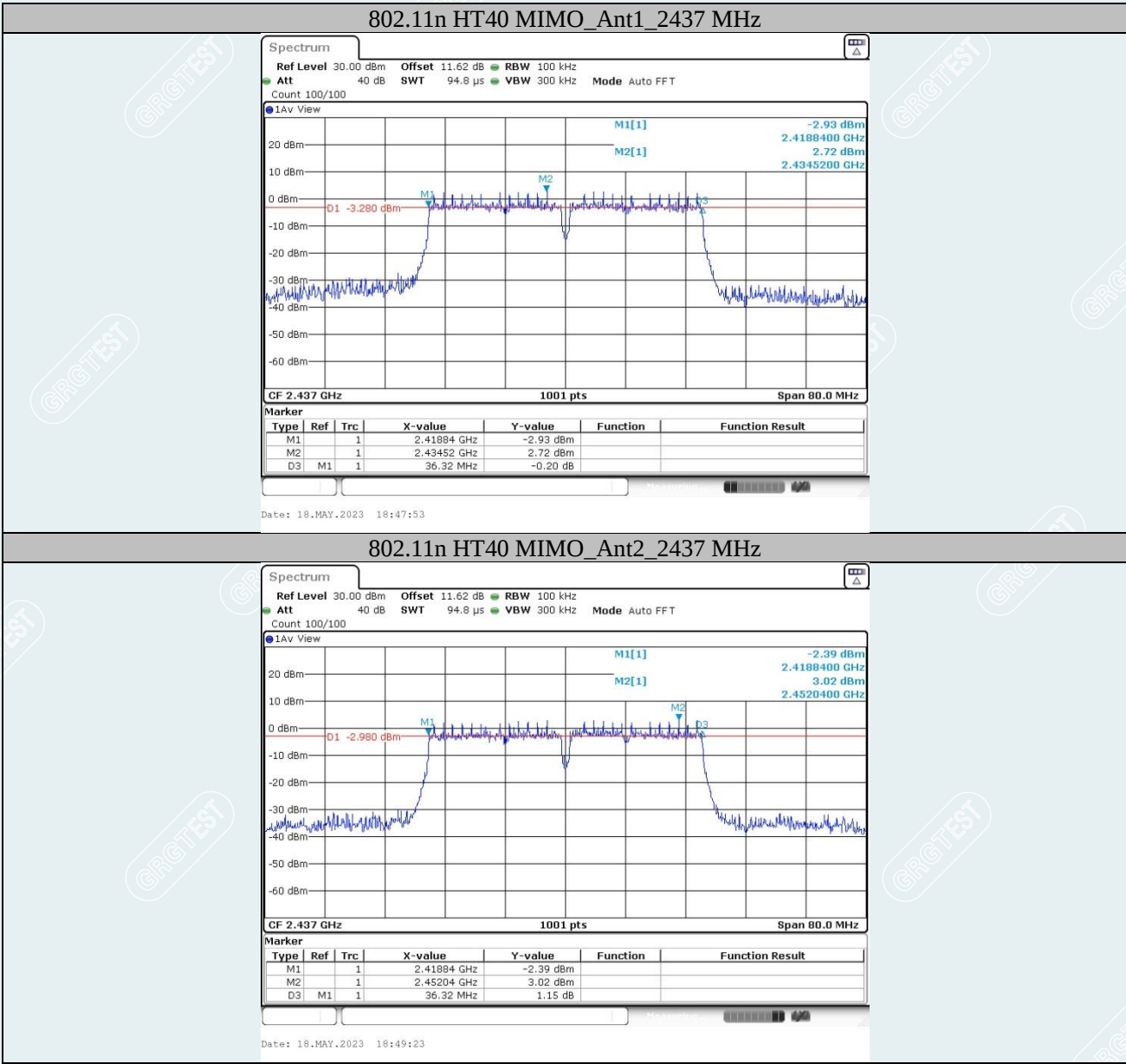


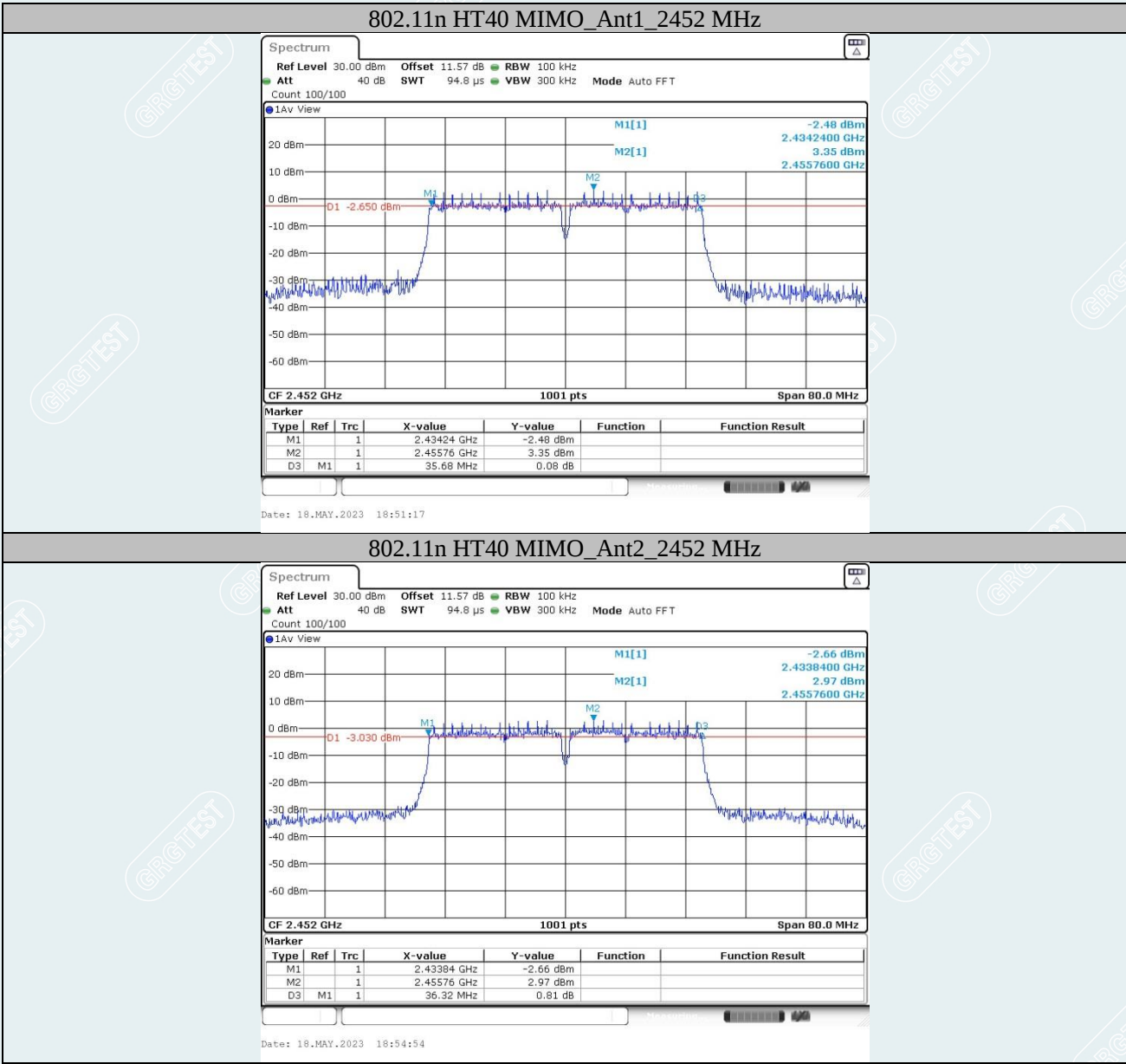


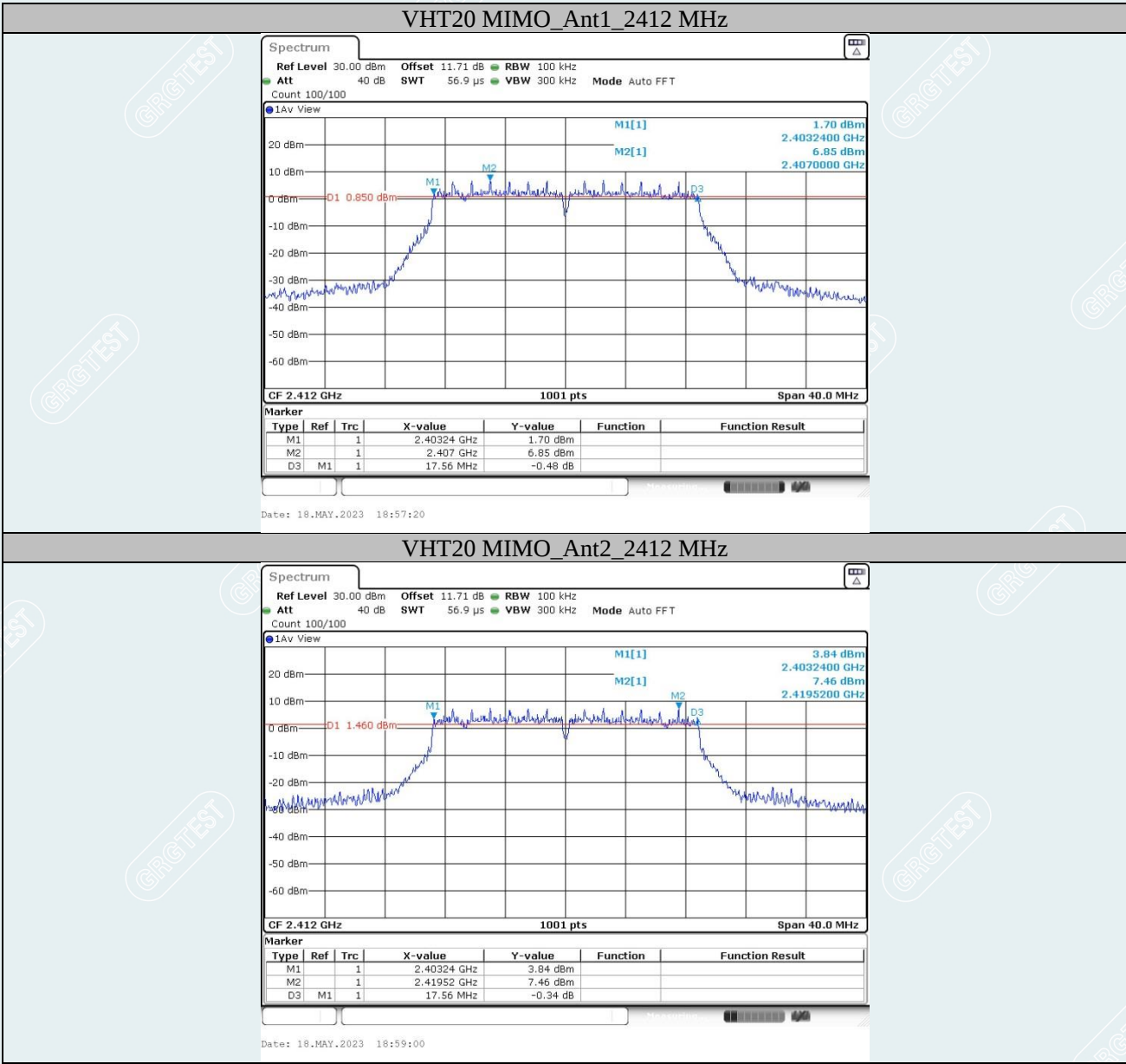


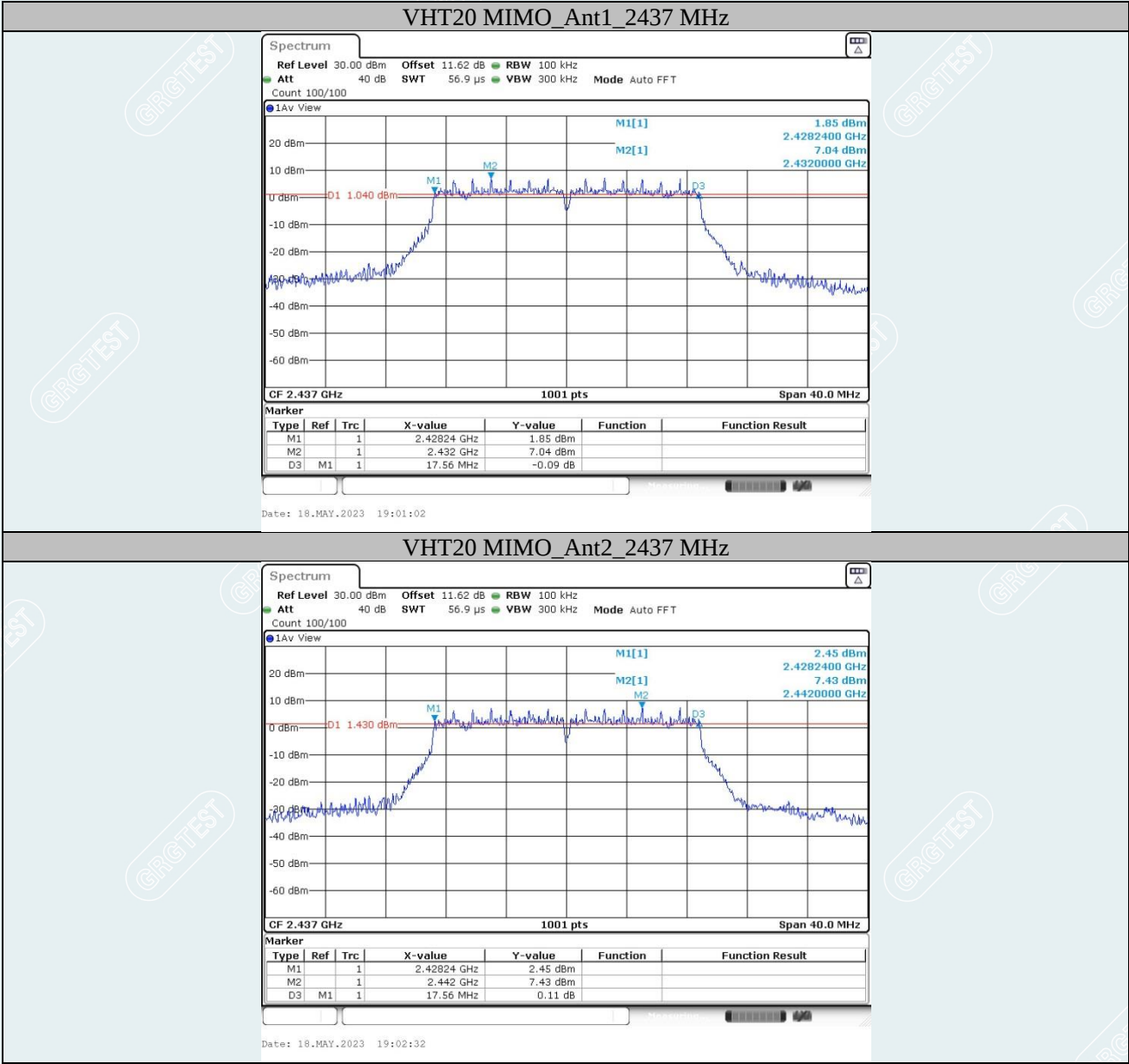


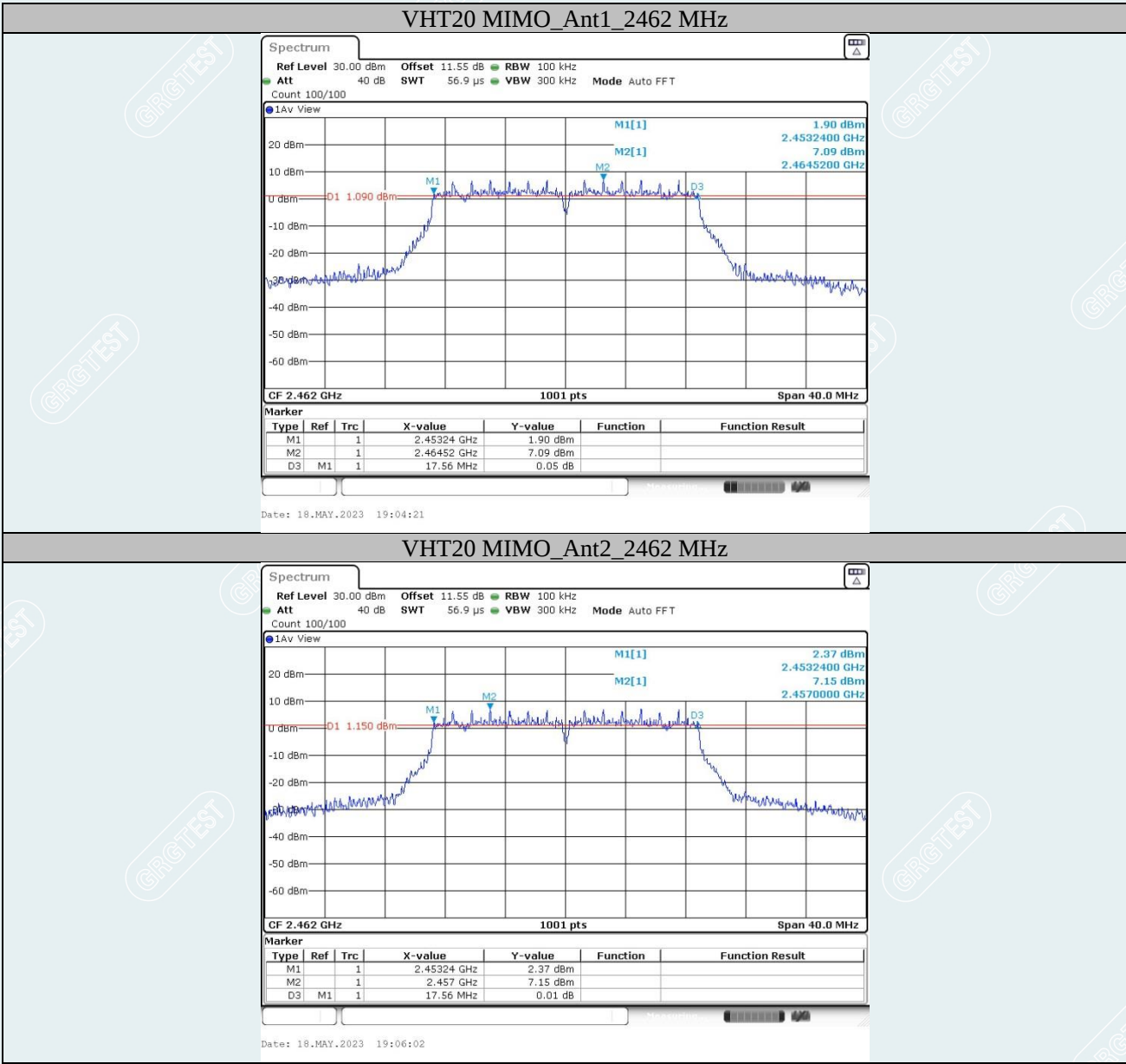


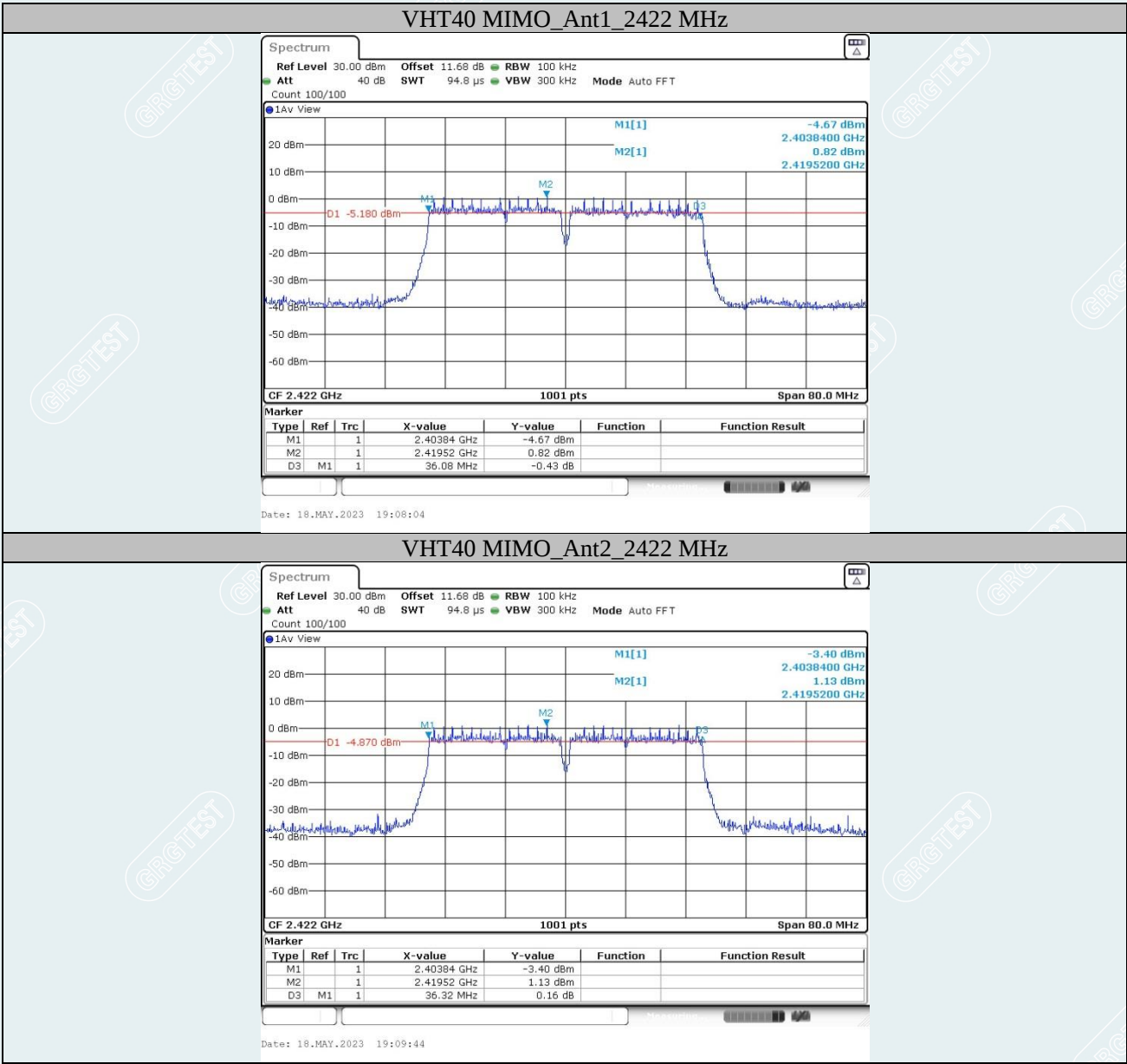


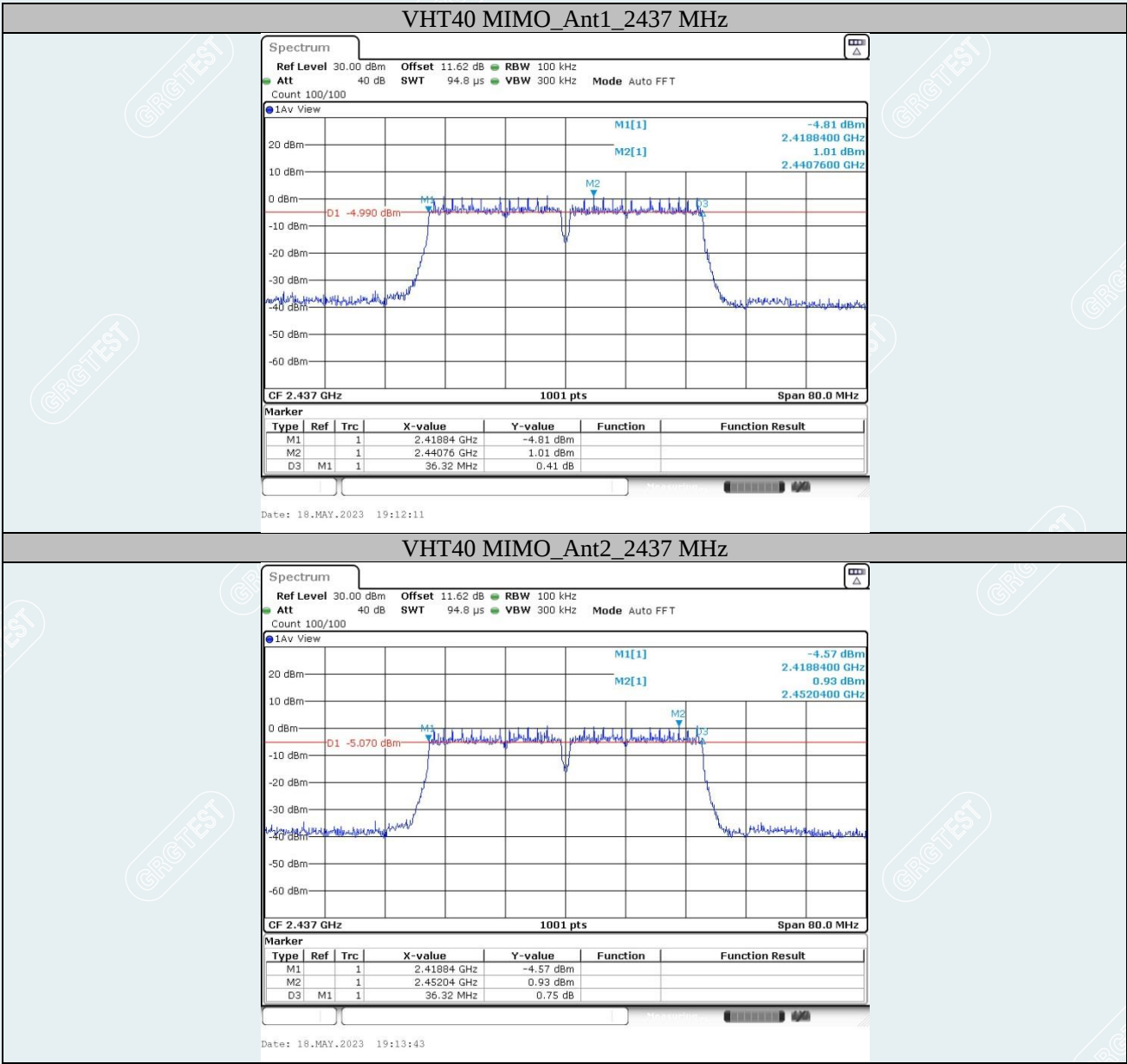


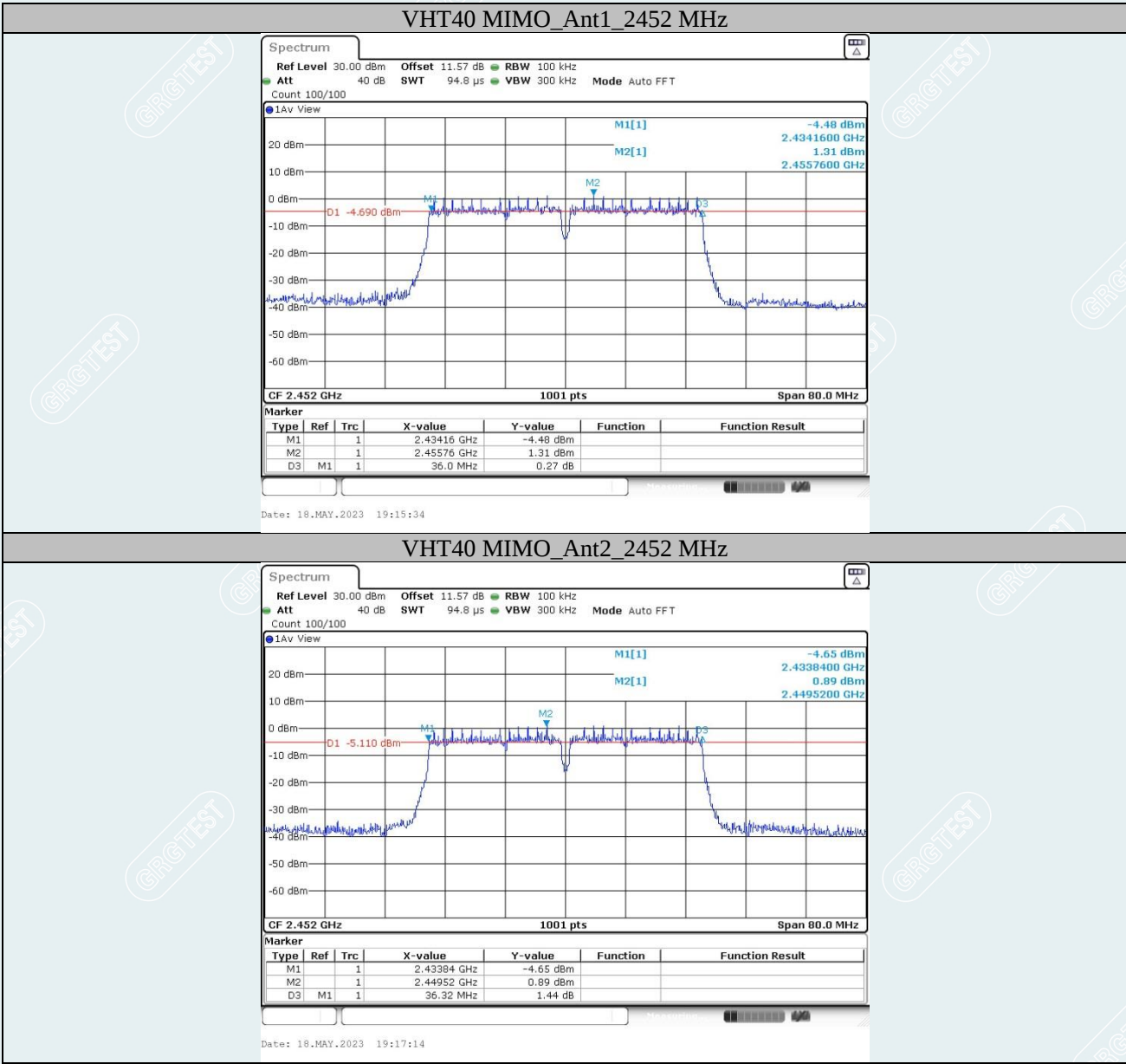


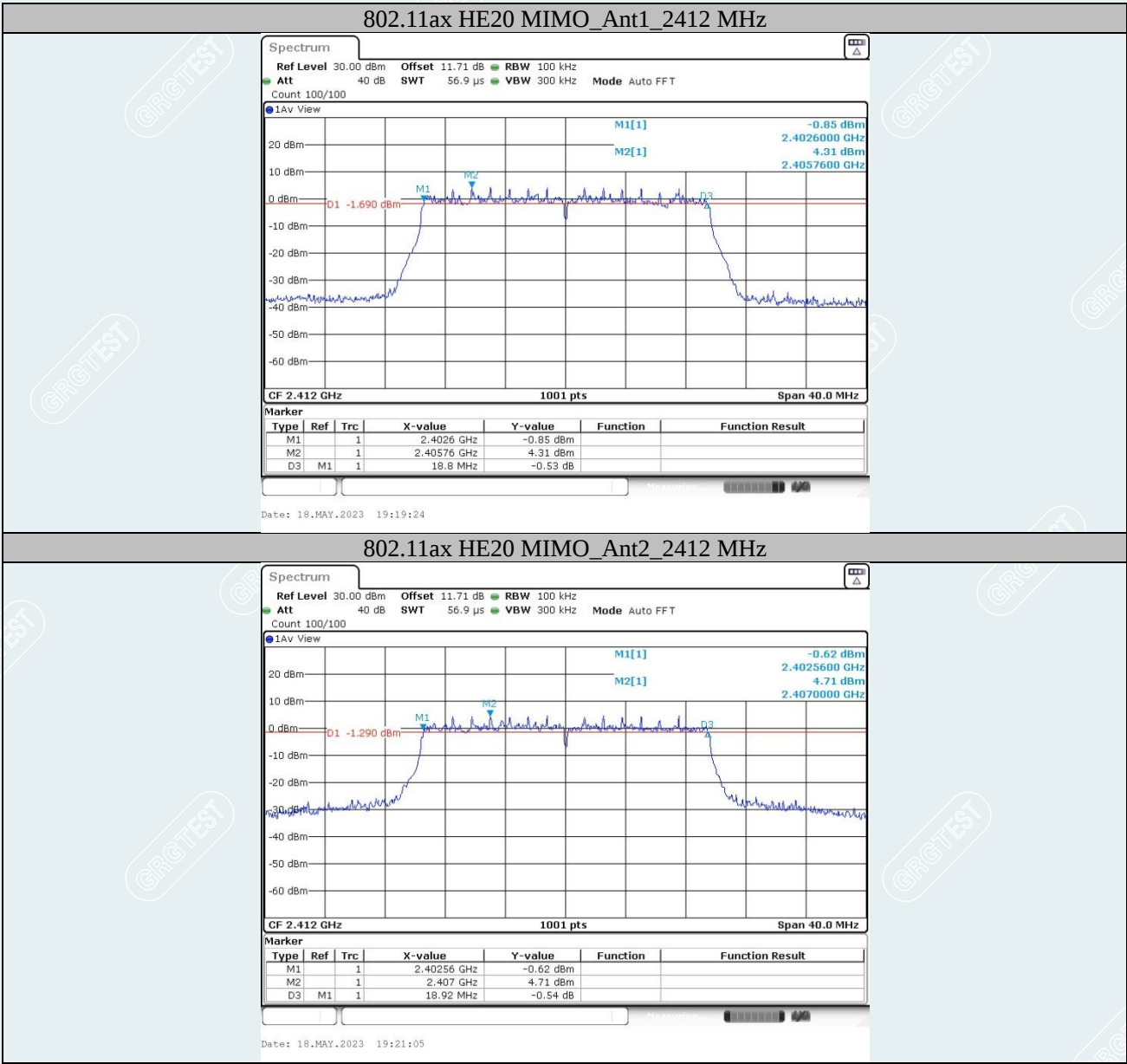


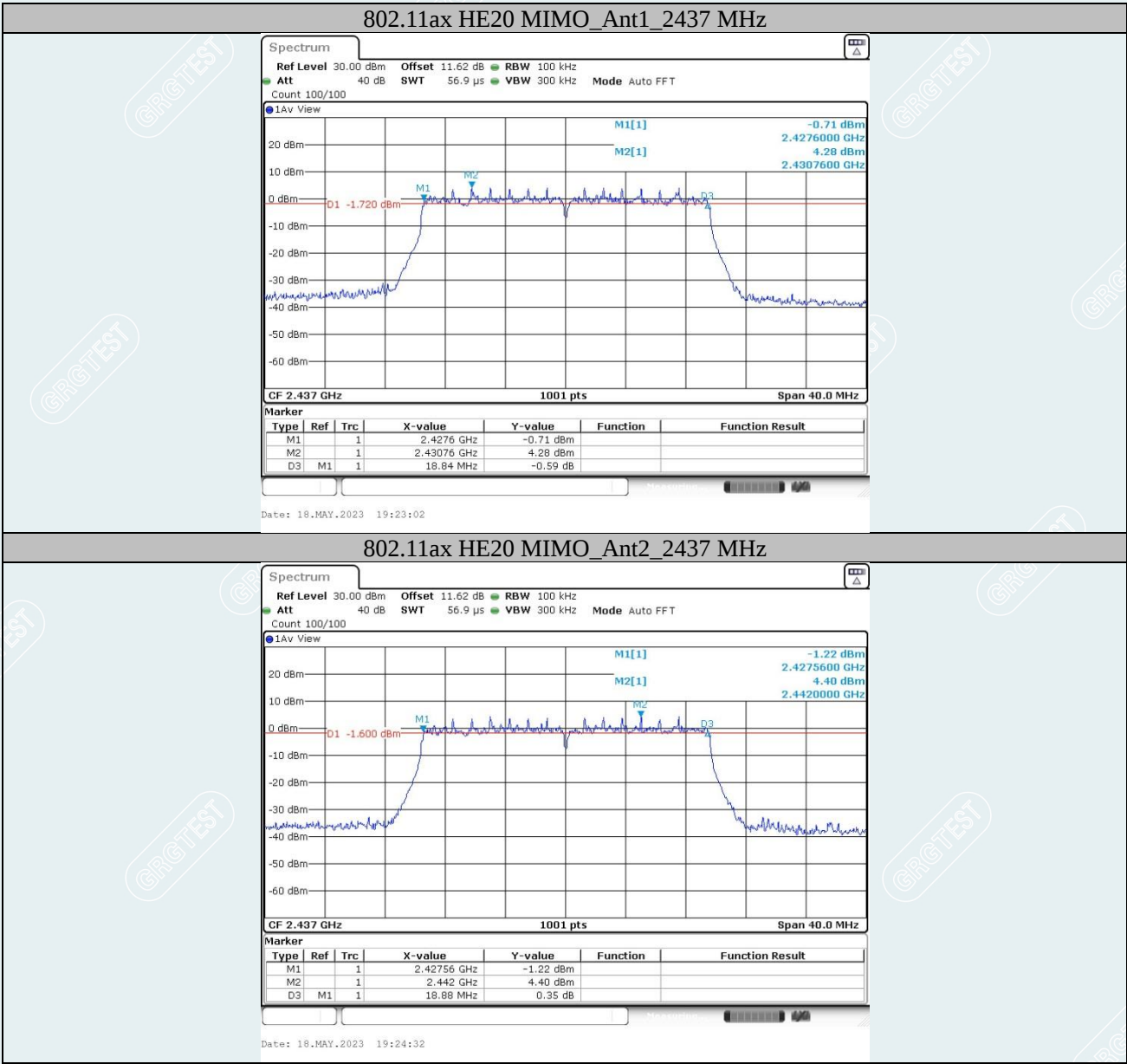


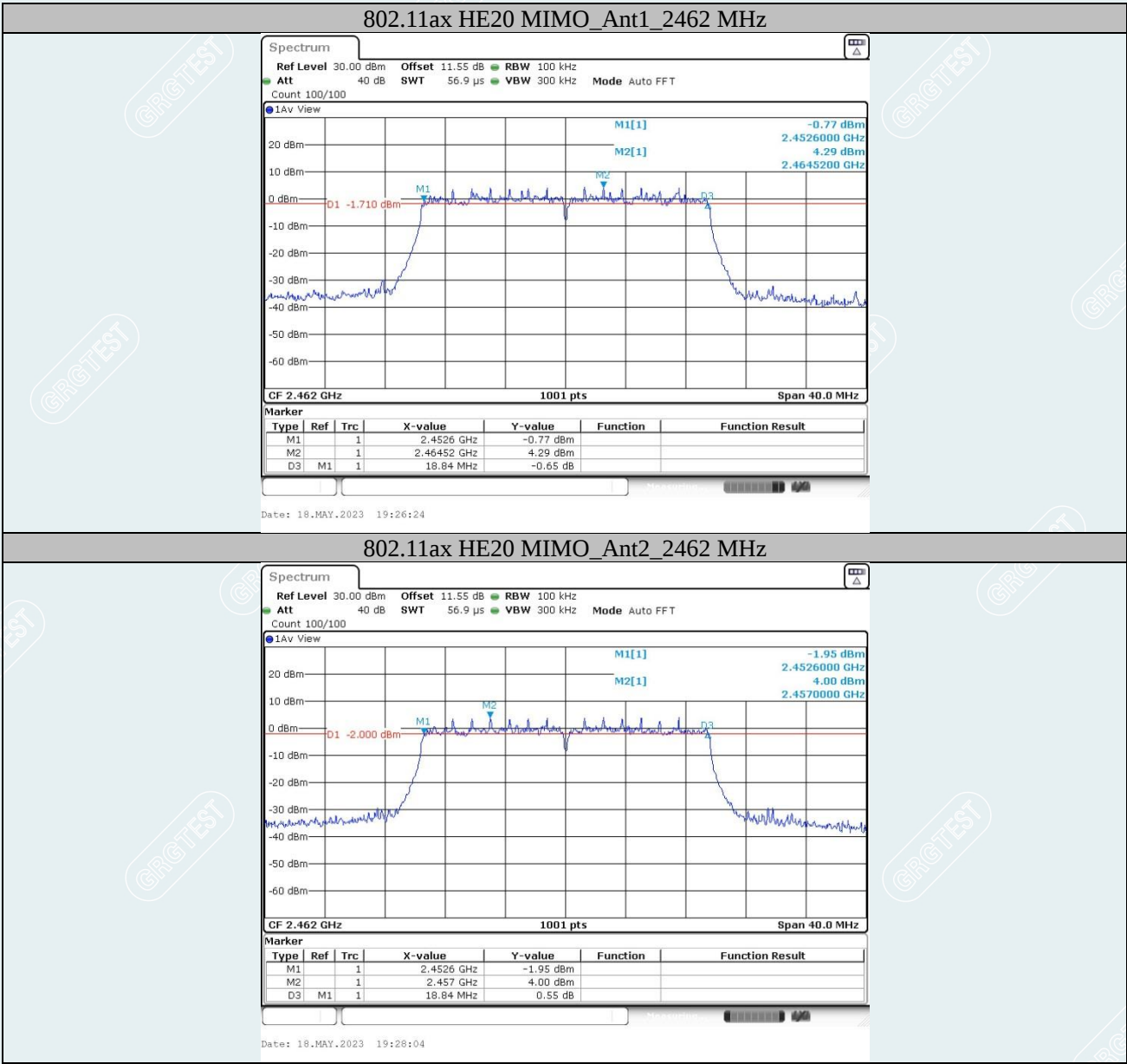


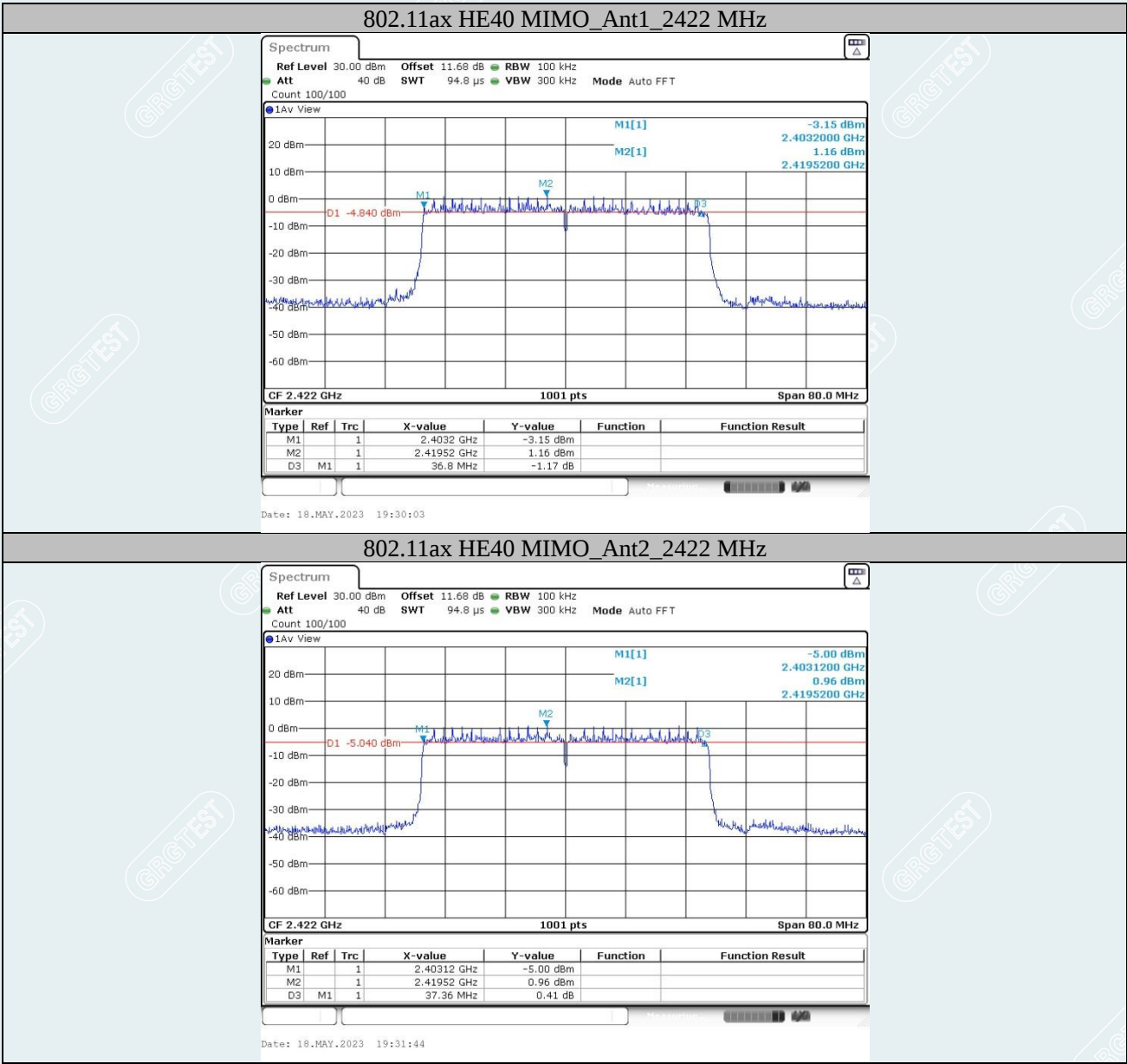


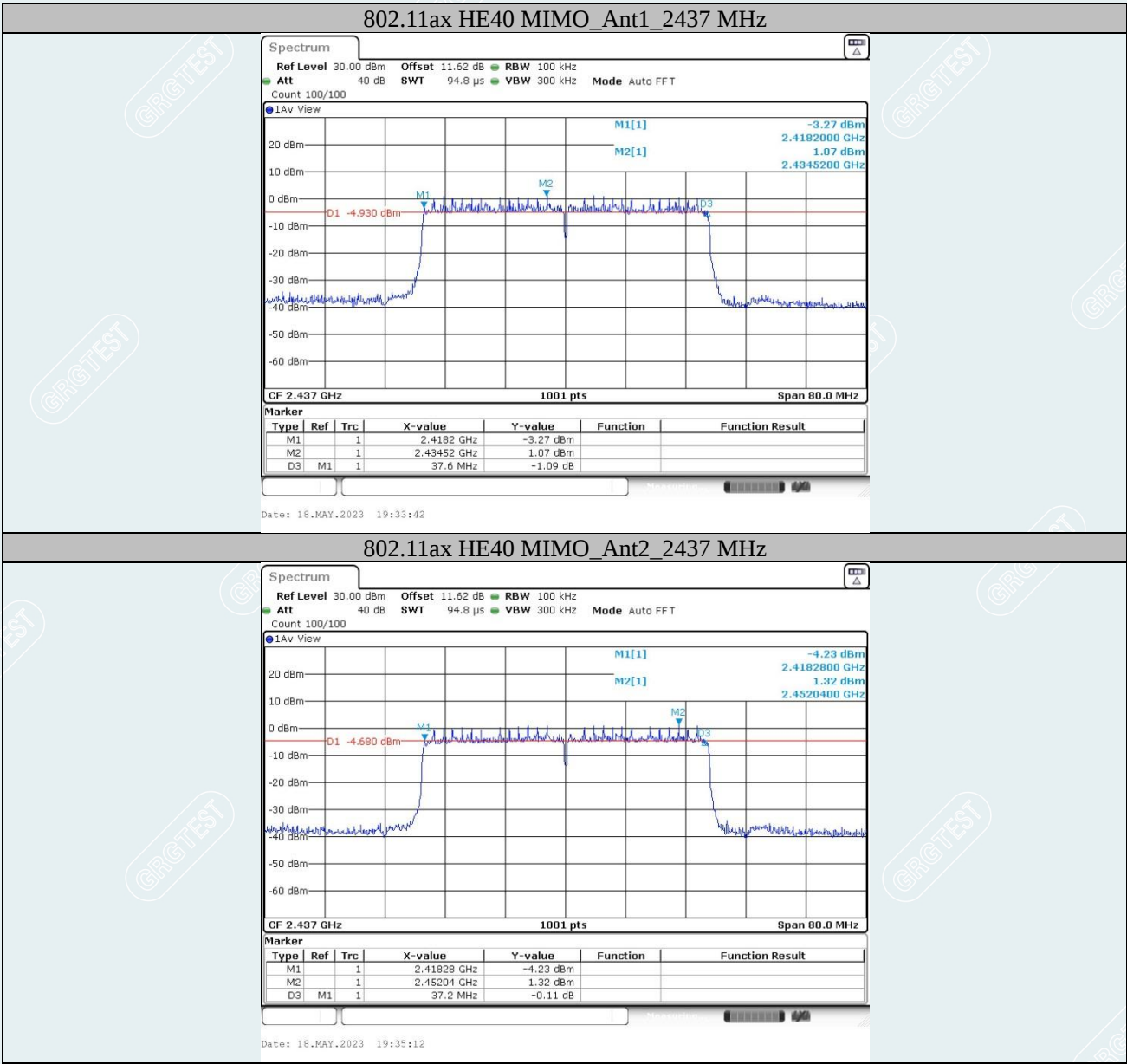


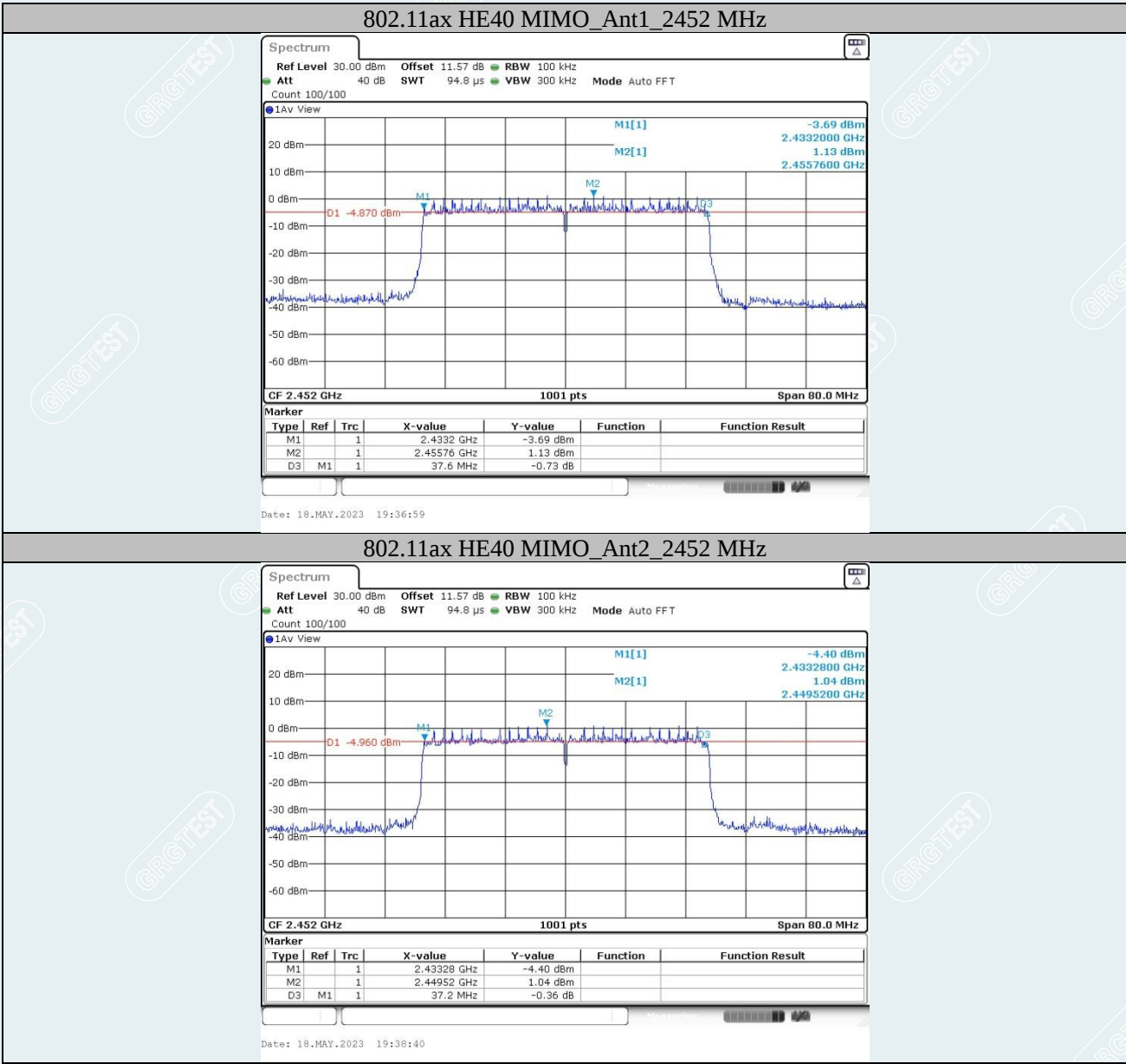












8. CONDUCTED OUTPUT POWER

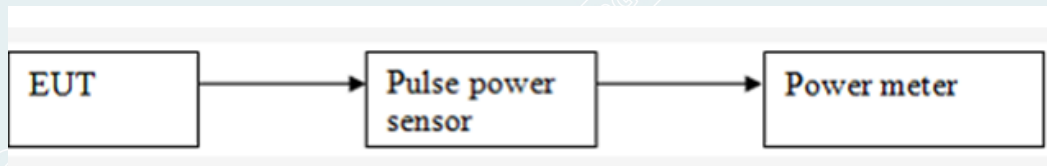
8.1. LIMITS

The maximum output power measurement is 1W

8.2. TEST PROCEDURES

- 1) RF output of EUT was connected to the broadband peak RF power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 2) Set to the maximum power setting and enable the EUT transmit continuously.
- 3) Measure the conducted output power and record the results in the test report.

8.3. TEST SETUP



----- The following blanks -----

8.4. TEST RESULT

Environment: 24.3°C/51%RH/101.0kPa

Tested By: Huang Tianmei

Non Beamforming

SISO

802.11b Mode:

Voltage: AC120V/60Hz

Date: 2023-05-17~2023-06-21

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
1	2412	21.19	20.54	/	AVG	30.00dBm	Pass
6	2437	20.99	20.80	/			Pass
11	2462	21.69	21.20	/			Pass

802.11g Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
1	2412	20.80	21.12	/	AVG	30.00dBm	Pass
6	2437	21.07	20.99	/			Pass
11	2462	20.99	20.62	/			Pass

CDD

802.11b Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
1	2412	18.14	18.02	21.09	AVG	29.10dBm	Pass
6	2437	18.42	18.00	21.22			Pass
11	2462	17.97	17.90	20.94			Pass

802.11g Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
1	2412	17.33	17.68	20.52	AVG	29.10dBm	Pass
6	2437	17.44	17.31	20.39			Pass
11	2462	17.50	17.29	20.41			Pass

802.11n HT20 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
1	2412	17.89	17.87	20.89	AVG	29.10dBm	Pass
6	2437	18.43	18.29	21.37			Pass
11	2462	17.84	17.76	20.81			Pass

802.11n HT40 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
3	2422	18.09	18.28	21.19	AVG	29.10dBm	Pass
6	2437	18.34	18.13	21.24			Pass
9	2452	18.36	17.97	21.18			Pass

VHT20 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
1	2412	18.99	19.28	22.15	AVG	29.10dBm	Pass
6	2437	19.08	19.10	22.10			Pass
11	2462	19.01	18.89	21.96			Pass

VHT40 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
3	2422	16.08	16.12	19.11	AVG	29.10dBm	Pass
6	2437	16.35	16.11	19.24			Pass
9	2452	16.36	15.87	19.13			Pass

802.11ax HE20 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
1	2412	16.48	16.67	19.59	AVG	29.10dBm	Pass
6	2437	16.55	16.58	19.57			Pass
11	2462	16.53	16.31	19.43			Pass

802.11ax HE40 Mode:

Channel No.	Frequency (MHz)	Measured Channel Power (dBm)			Peak / AVG	Limit	Result
		antenna 1	antenna 2	total			
3	2422	16.57	16.56	19.58	AVG	29.10dBm	Pass
6	2437	16.59	16.32	19.47			Pass
9	2452	16.76	16.12	19.47			Pass

Note

1. The measured results were corrected by duty cycle factor (section 2.8)
2. measurements on IEEE 802.11 devices. This EUT supports MIMO 2X2, any transmit signals are correlated with each other, So Directional gain = $10\log[(10^{3.97/20} + 10^{3.85/20})^2/2]$ dBi, that is Directional gain (dBi) = 6.9
3. Antenna gain is greater than 6, Output Power Limit = $30 - (6.9 - 6) = 29.10$ dBm

----- The following blanks -----