

A.5 TIME OF OCCUPANCY

Test Date	2024/07/26	Temp./Hum.	24°C/54%
Cable Loss	1.50 dB	Tested By	Sean Wang
Test Voltage	DC 7.4V (Via Battery)		

A.5.1 Time of Occupancy

Test Mode: #1 With TC57A RF Module

Mode	Centre Frequency (MHz)	Each second appearance transmission	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
FASSTest	2405.376	3	1.450	40.020	<400
	2439.168	3	1.400	38.640	<400
	2472.960	3	1.450	40.020	<400

Observation Period:

23 channels* **0.4** seconds= **9.2** seconds

Centre Frequency: 2405.376MHz

For each second of **3** transmission appearance, the longest time of occupancy is
3 channels* **9.2** /1* **1.450** ms= **40.020** ms (<400ms)

Centre Frequency: 2439.168MHz

For each second of **3** transmission appearance, the longest time of occupancy is
3 channels* **9.2** /1* **1.400** ms= **38.640** ms (<400ms)

Centre Frequency: 2472.960MHz

For each second of **3** transmission appearance, the longest time of occupancy is
3 channels* **9.2** /1* **1.450** ms= **40.020** ms (<400ms)

Test Mode: #1 With TC57A RF Module

Mode	Centre Frequency (MHz)	Each second appearance transmission	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
S-FHSS	2403.25	5	2.780	333.600	<400
	2425.00	5	2.780	333.600	<400
	2447.50	5	2.780	333.600	<400

Observation Period:

60 channels* **0.4** seconds= **24.0** seconds

Centre Frequency: 2403.25MHz

For each second of **5** transmission appearance, the longest time of occupancy is
5 channels* **24.0** /1* **2.780** ms= **333.600** ms (<400ms)

Centre Frequency: 2425.00MHz

For each second of **5** transmission appearance, the longest time of occupancy is
5 channels* **24.0** /1* **2.780** ms= **333.600** ms (<400ms)

Centre Frequency: 2447.50MHz

For each second of **5** transmission appearance, the longest time of occupancy is
5 channels* **24.0** /1* **2.780** ms= **333.600** ms (<400ms)

Test Mode: #1 With TC57A RF Module

Mode	Centre Frequency (MHz)	Each second appearance transmission	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
T-FHSS	2407.50	2	1.450	35.9600	<400
	2437.50	2	1.450	35.9600	<400
	2467.50	2	1.450	35.9600	<400

Observation Period:

31 channels* 0.4 seconds= 12.4 seconds

Centre Frequency: 2407.50MHz

For each second of 2 transmission appearance, the longest time of occupancy is
 2 channels* 12.4 /1* 1.4500 ms = 35.9600 ms (<400ms)

Centre Frequency: 2437.50MHz

For each second of 2 transmission appearance, the longest time of occupancy is
 2 channels* 12.4 /1* 1.4500 ms = 35.9600 ms (<400ms)

Centre Frequency: 2467.50MHz

For each second of 2 transmission appearance, the longest time of occupancy is
 2 channels* 12.4 /1* 1.4500 ms = 35.9600 ms (<400ms)

Test Mode: #2 With WTR-16 RF Board

Mode	Centre Frequency (MHz)	Each second appearance transmission	Time of Occupancy (ms)	Maximum accumulated Time of Occupancy (ms)	Limit (ms)
T-FHSS	2407.50	1	1.650	20.4600	<400
	2437.50	1	1.650	20.4600	<400
	2467.50	1	1.600	19.8400	<400

Observation Period:

31 channels* 0.4 seconds= 12.4 seconds

Centre Frequency: 2407.50MHz

For each second of 1 transmission appearance, the longest time of occupancy is
 1 channels* 12.4 /1* 1.6500 ms = 20.4600 ms (<400ms)

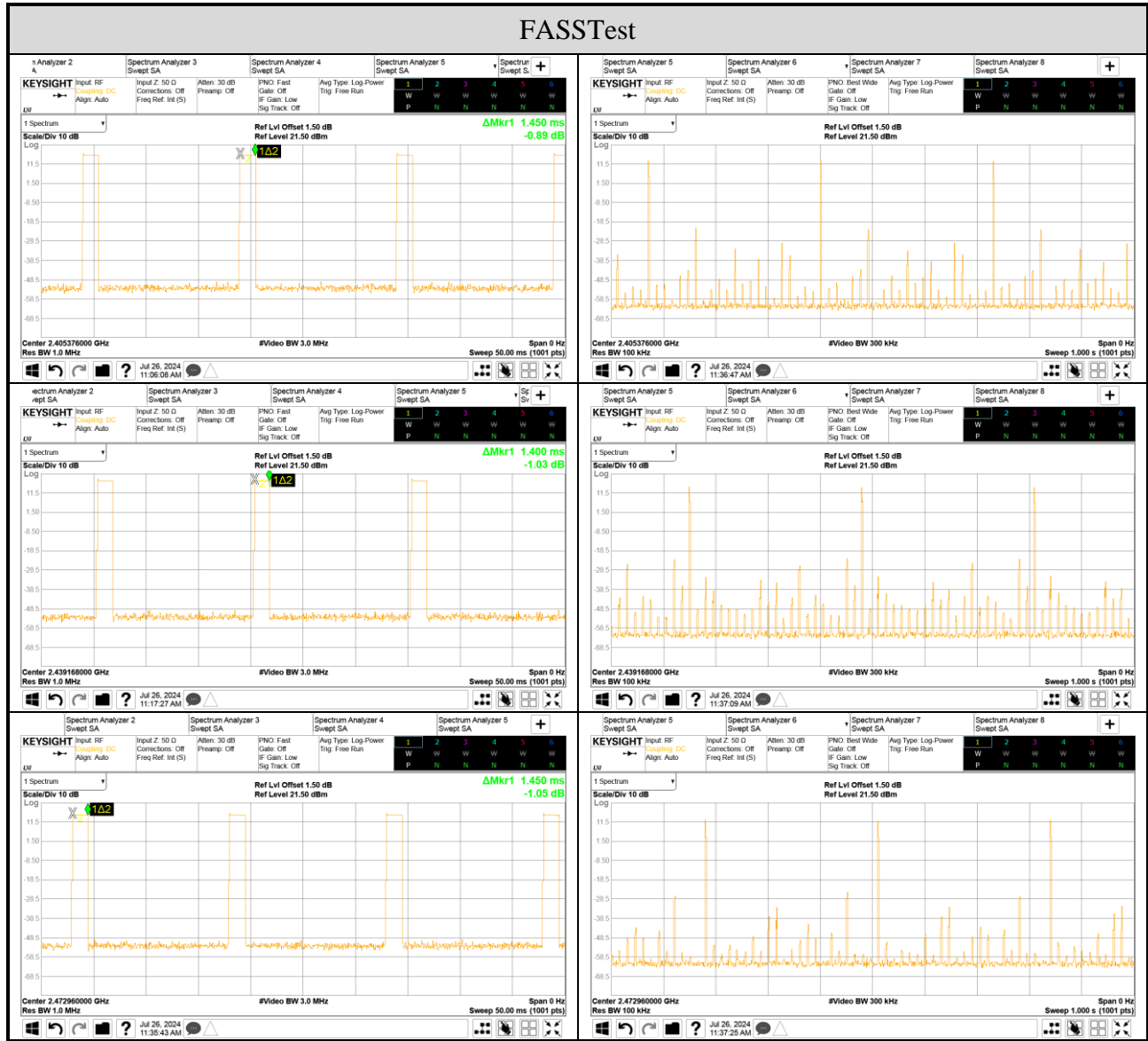
Centre Frequency: 2437.50MHz

For each second of 1 transmission appearance, the longest time of occupancy is
 1 channels* 12.4 /1* 1.6500 ms = 20.4600 ms (<400ms)

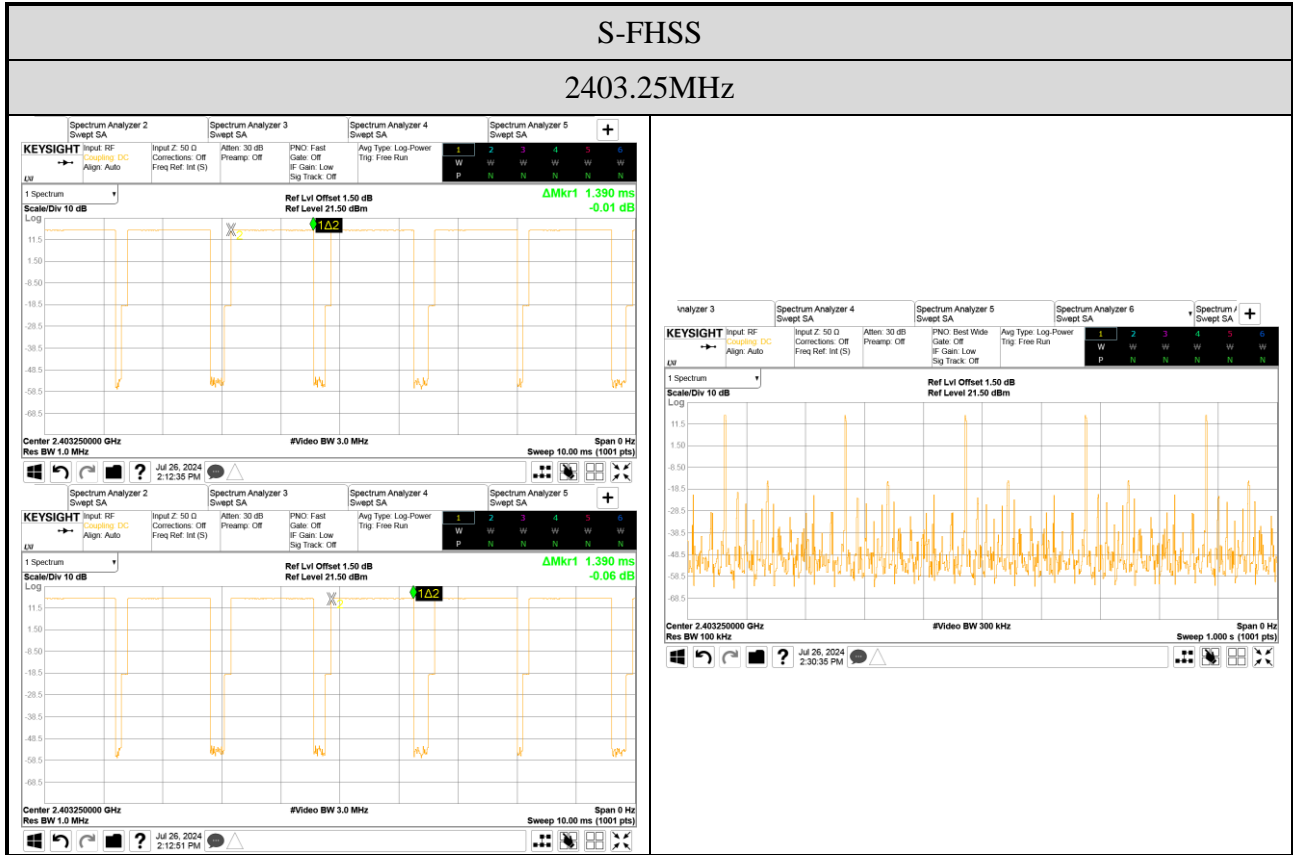
Centre Frequency: 2467.50MHz

For each second of 1 transmission appearance, the longest time of occupancy is
 1 channels* 12.4 /1* 1.6000 ms = 19.8400 ms (<400ms)

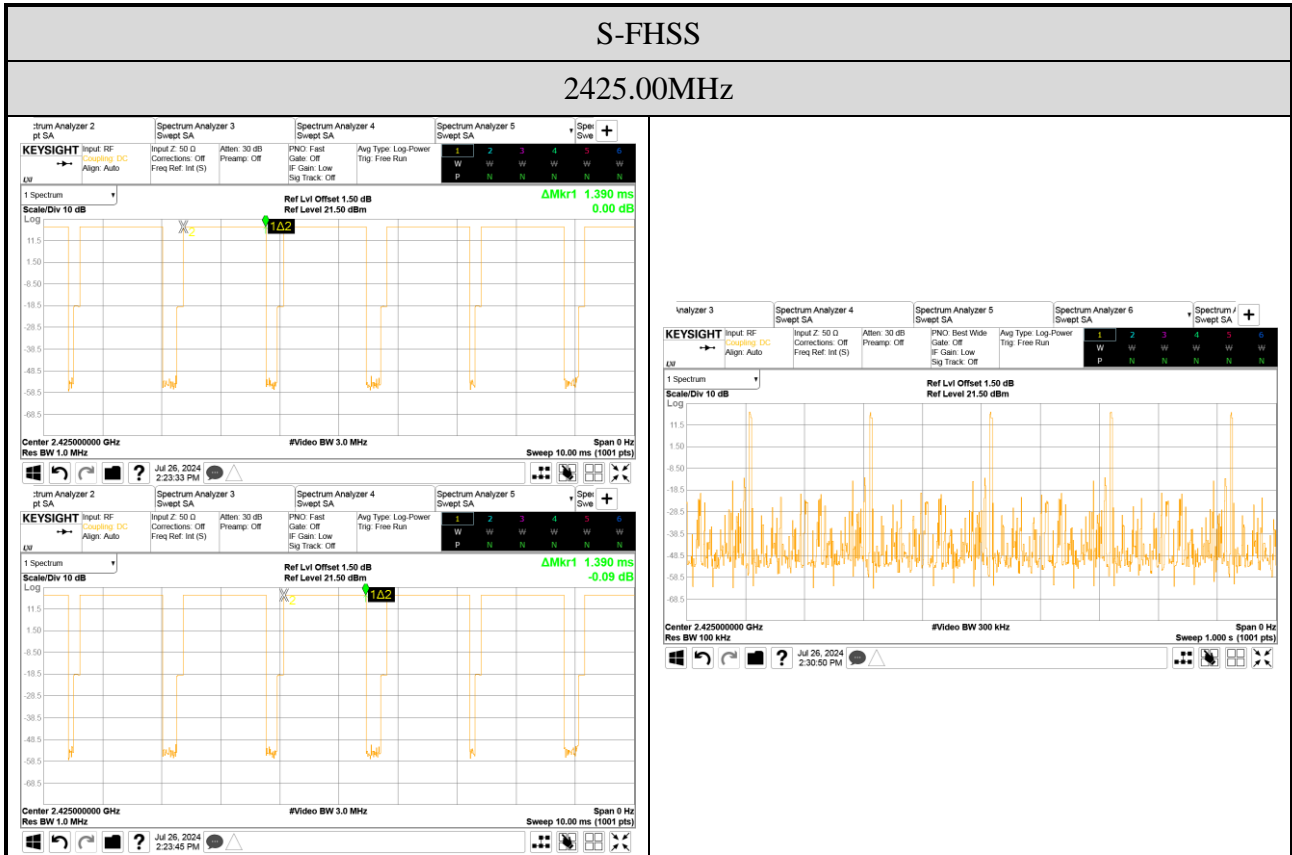
A.5.2 Measurement Plots Test Mode: #1 With TC57A RF Module



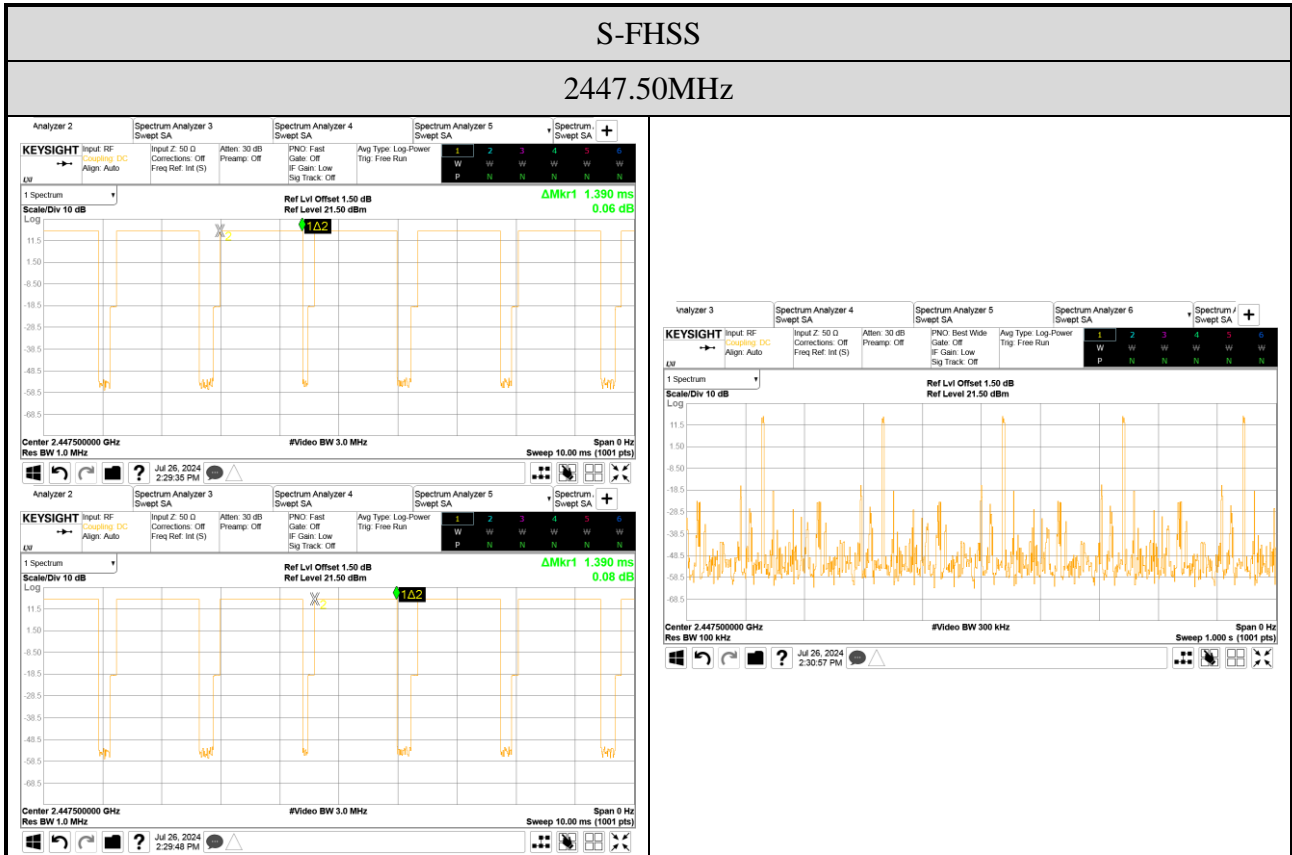
Test Mode: #1 With TC57A RF Module



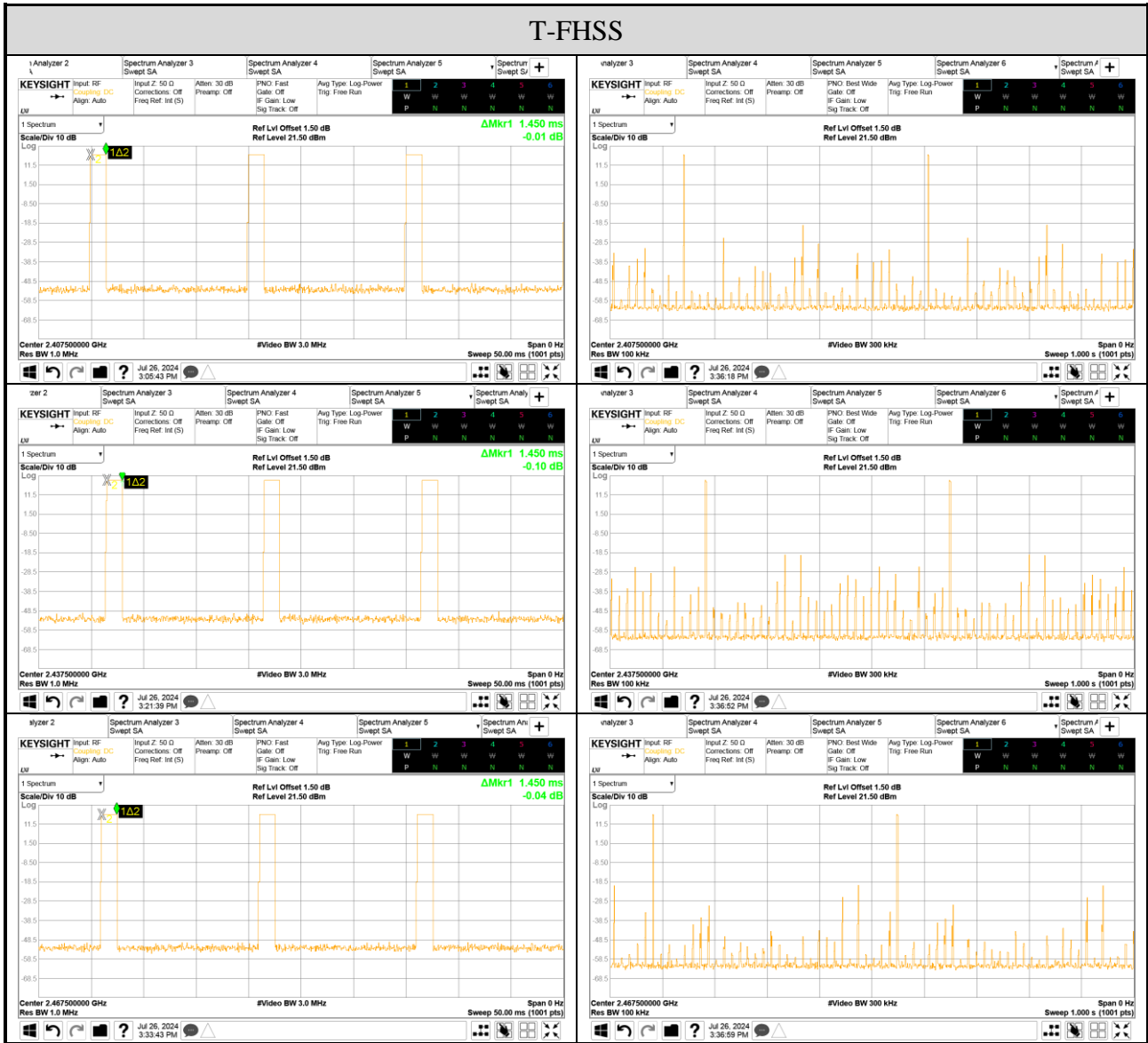
Test Mode: #1 With TC57A RF Module



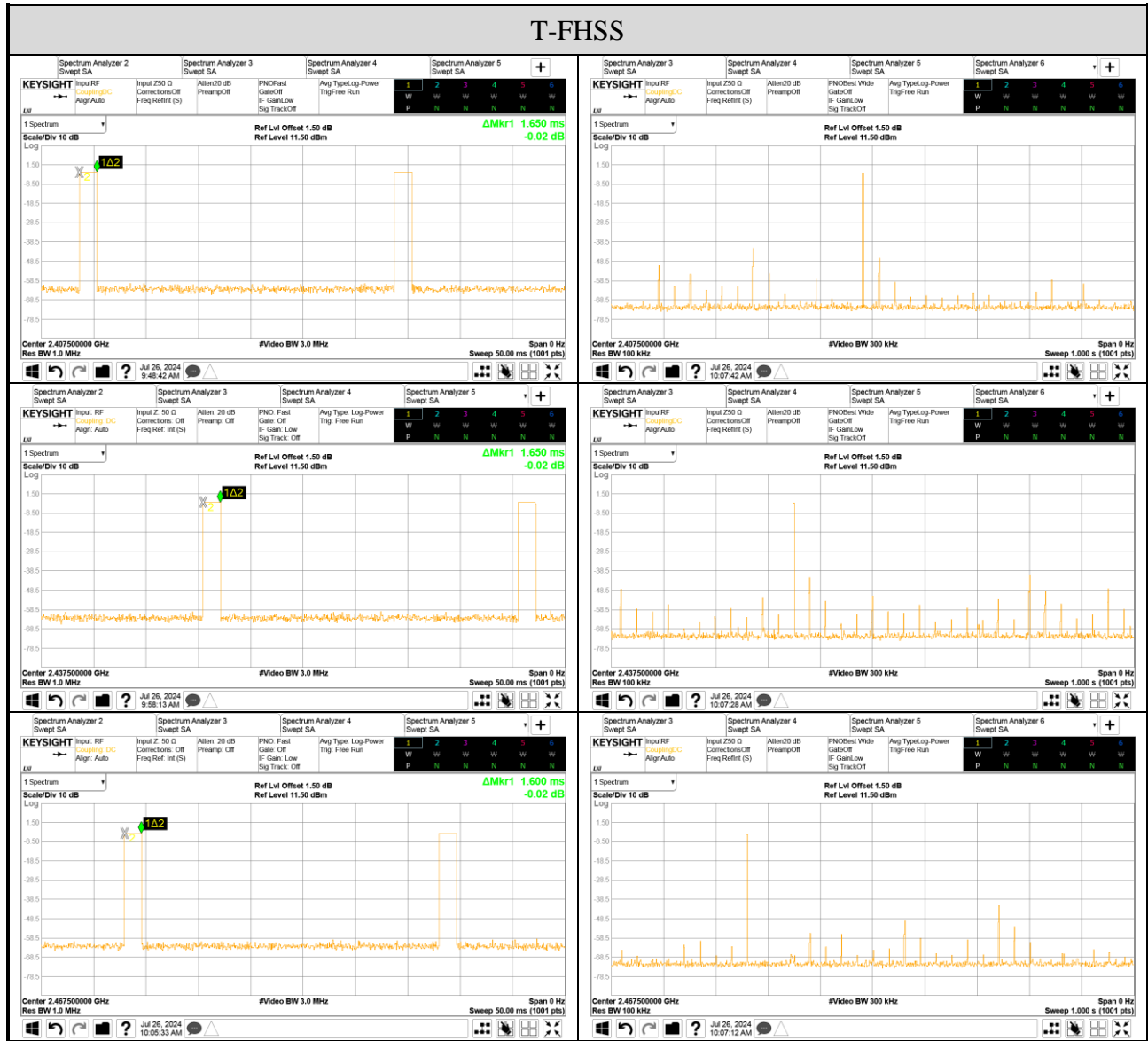
Test Mode: #1 With TC57A RF Module



Test Mode: #1 With TC57A RF Module



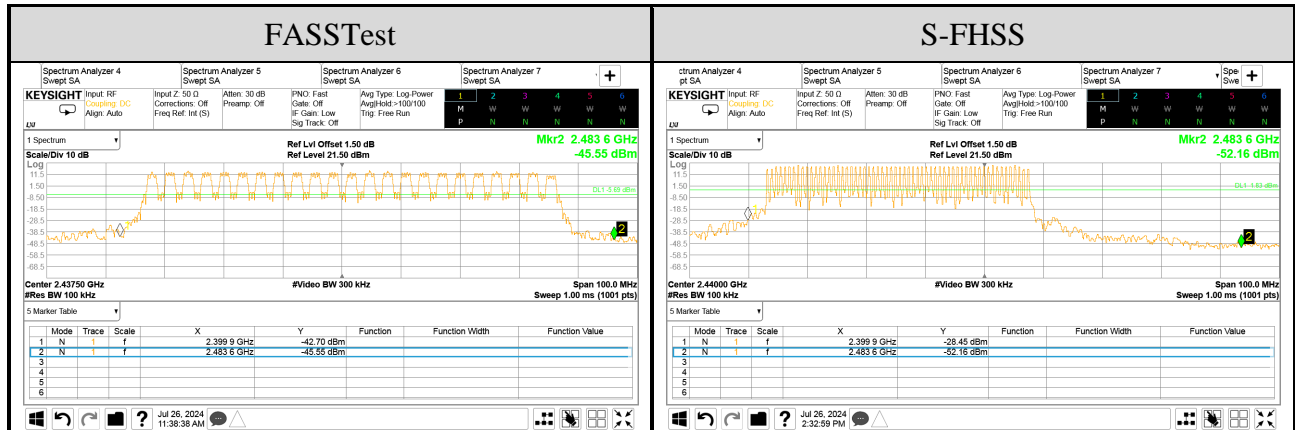
Test Mode: #2 With WTR-16 RF Board



A.6 NUMBER OF HOPPING CHANNELS

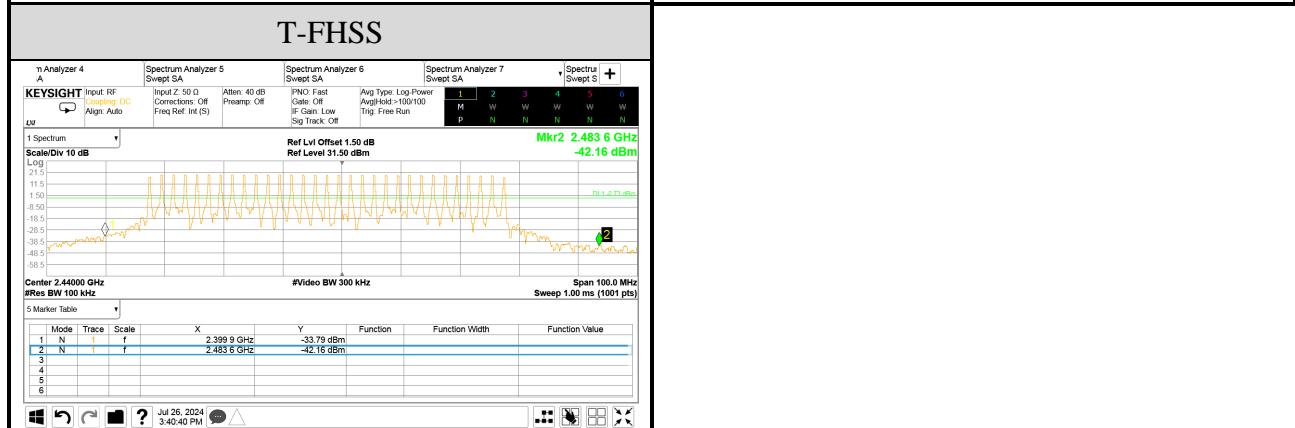
Test Date	2024/07/26	Temp./Hum.	24°C/54%
Cable Loss	1.50 dB	Tested By	Sean Wang
Test Voltage	DC 7.4V (Via Battery)		

Test Mode: #1 With TC57A RF Module



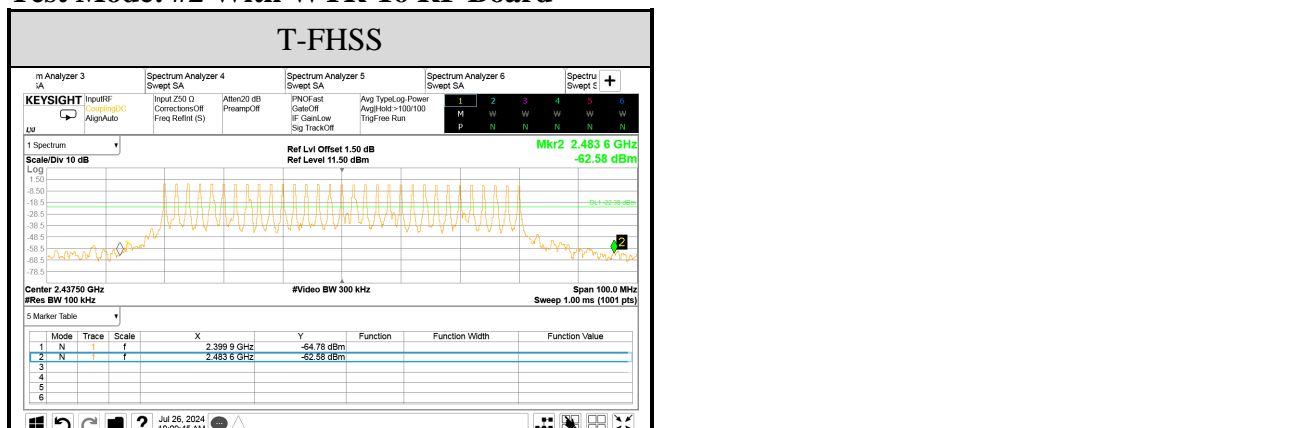
The number hopping channel is 23.

The number hopping channel is 60.



The number hopping channel is 31.

Test Mode: #2 With WTR-16 RF Board



The number hopping channel is 31.

A.7 MAXIMUM PEAK OUTPUT POWER

Test Date	2024/07/26	Temp./Hum.	24°C/54%
Cable Loss	1.50 dB	Tested By	Sean Wang
Test Voltage	DC 7.4V (Via Battery)		

A.7.1 Maximum Peak Output Power

Test Mode: #1 With TC57A RF Module

Mode	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
FASSTest	2405.376	16.95	0.0495	21dBm (0.125W)
	2408.448	18.84	0.0766	
	2439.168	18.92	0.0780	
	2469.888	18.11	0.0647	
	2472.960	16.38	0.0435	

Test Mode: #1 With TC57A RF Module

Mode	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
S-FHSS	2403.250	15.93	0.0392	21dBm (0.125W)
	2404.000	16.24	0.0421	
	2404.750	18.11	0.0647	
	2425.000	18.01	0.0632	
	2446.000	17.94	0.0622	
	2446.750	16.08	0.0406	
	2447.500	15.97	0.0395	

Test Mode: #1 With TC57A RF Module

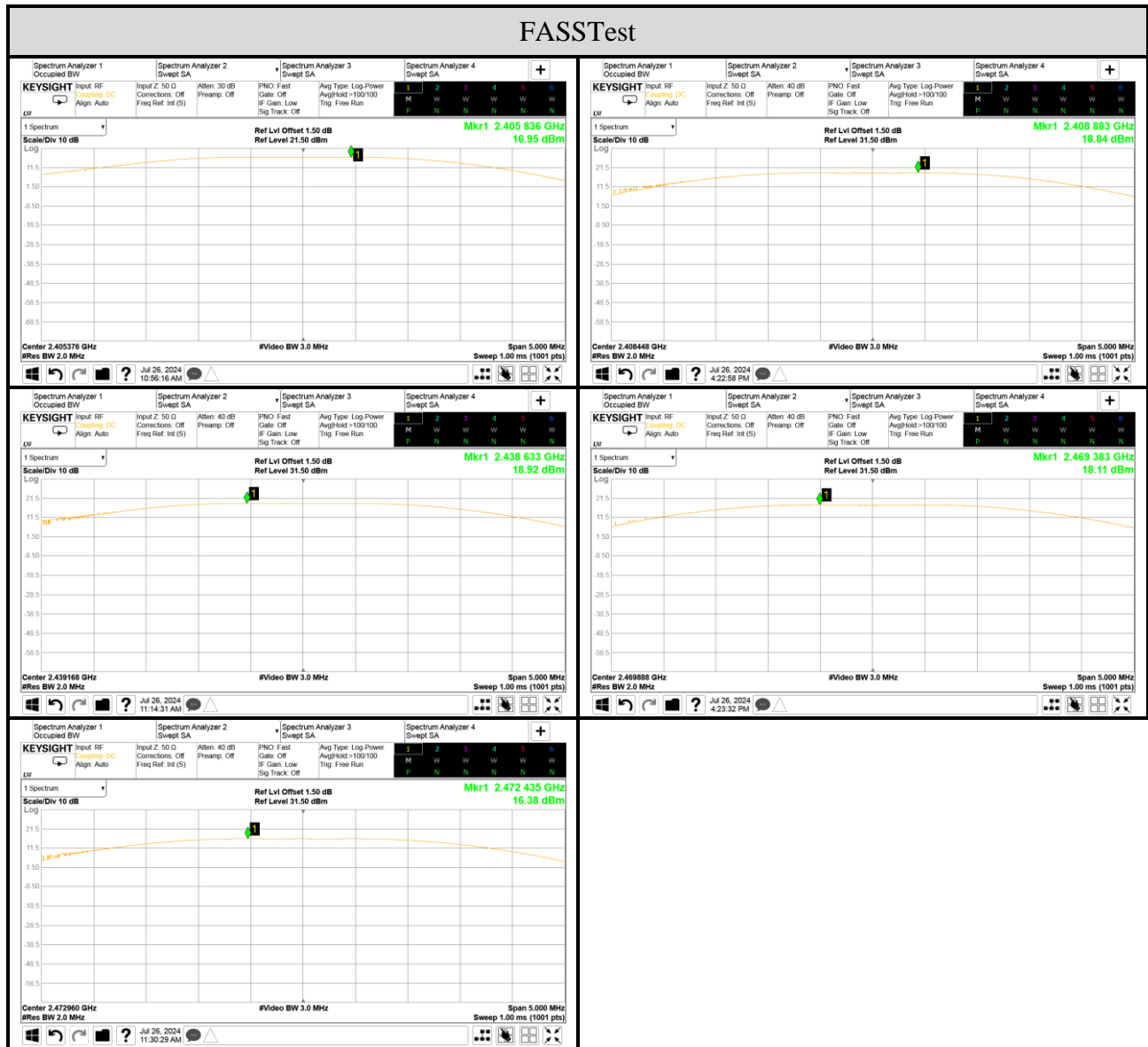
Mode	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
T-FHSS	2407.500	17.03	0.0505	21dBm (0.125W)
	2409.500	17.96	0.0625	
	2437.500	17.82	0.0605	
	2467.500	16.69	0.0467	

Test Mode: #2 With WTR-16 RF Board

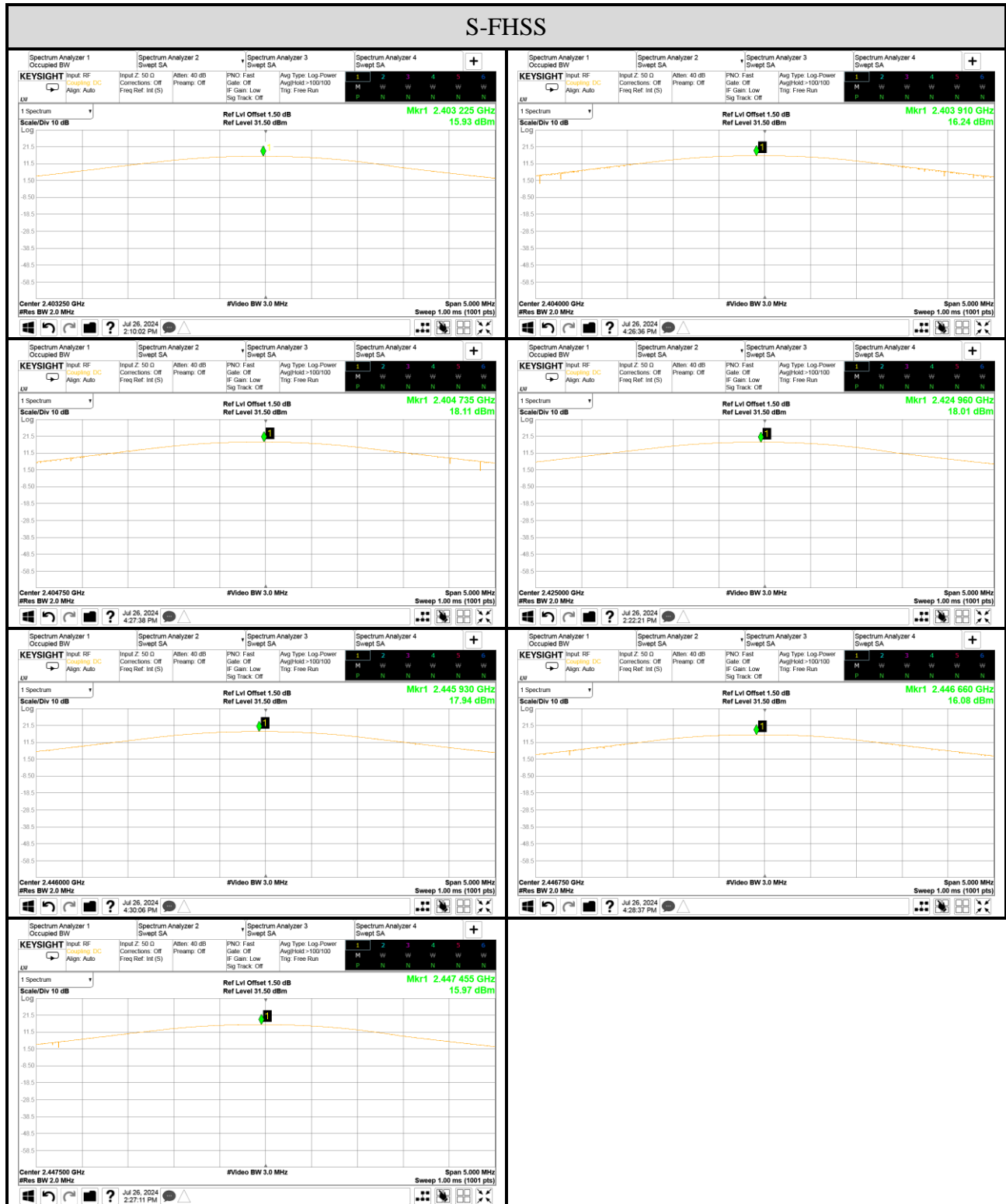
Mode	Centre Frequency (MHz)	Peak Output Power		Limit
		dBm	W	
T-FHSS	2407.500	-2.23	0.0006	21dBm (0.125W)
	2437.500	-2.79	0.0005	
	2467.500	-3.99	0.0004	

A.7.2 Measurement Plots

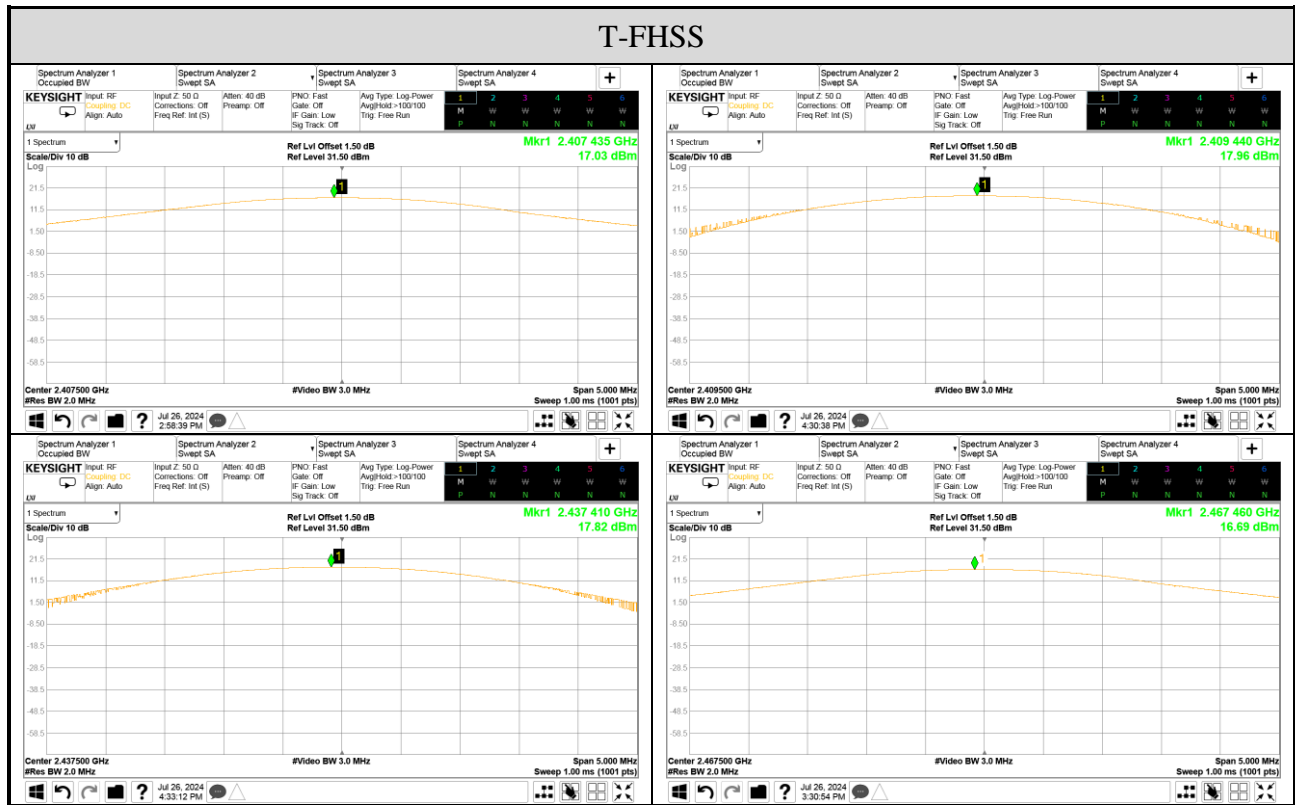
Test Mode: #1 With TC57A RF Module



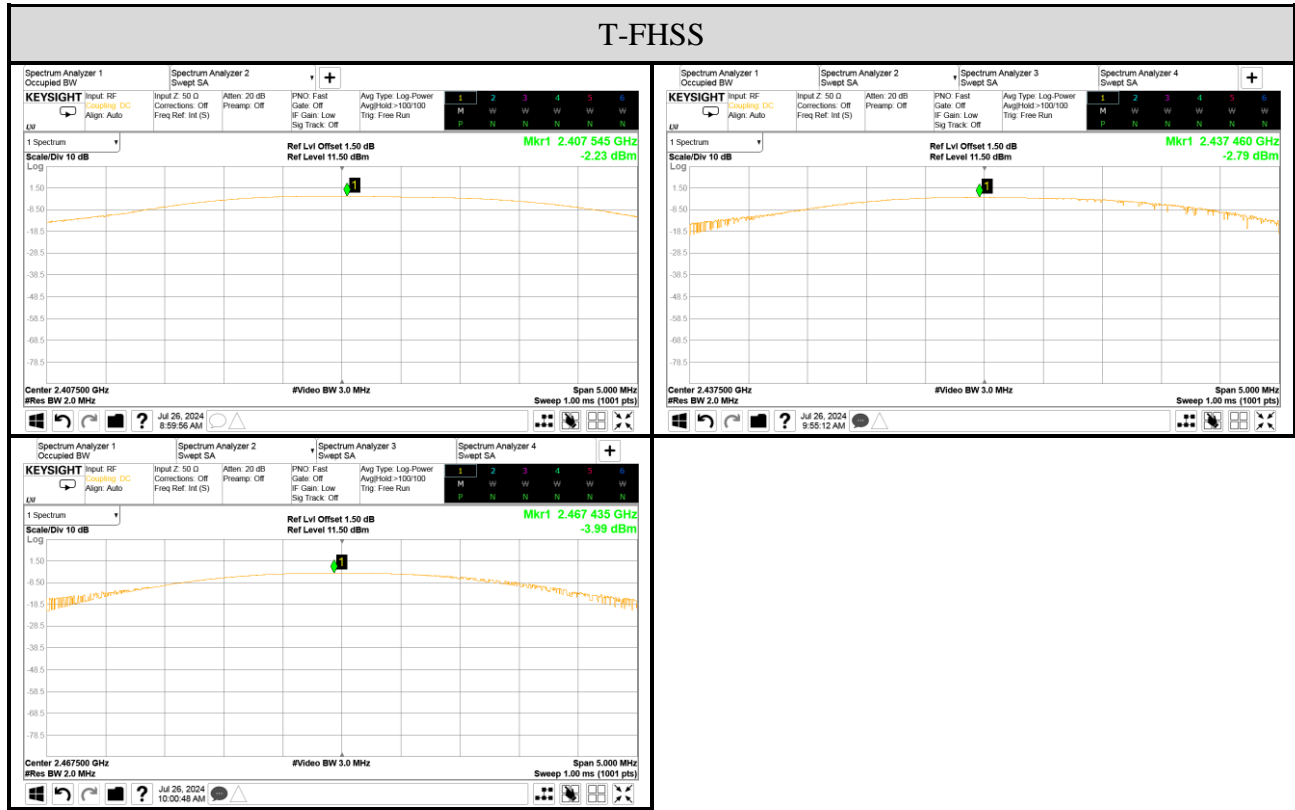
Test Mode: #1 With TC57A RF Module



Test Mode: #1 With TC57A RF Module



Test Mode: #2 With WTR-16 RF Board

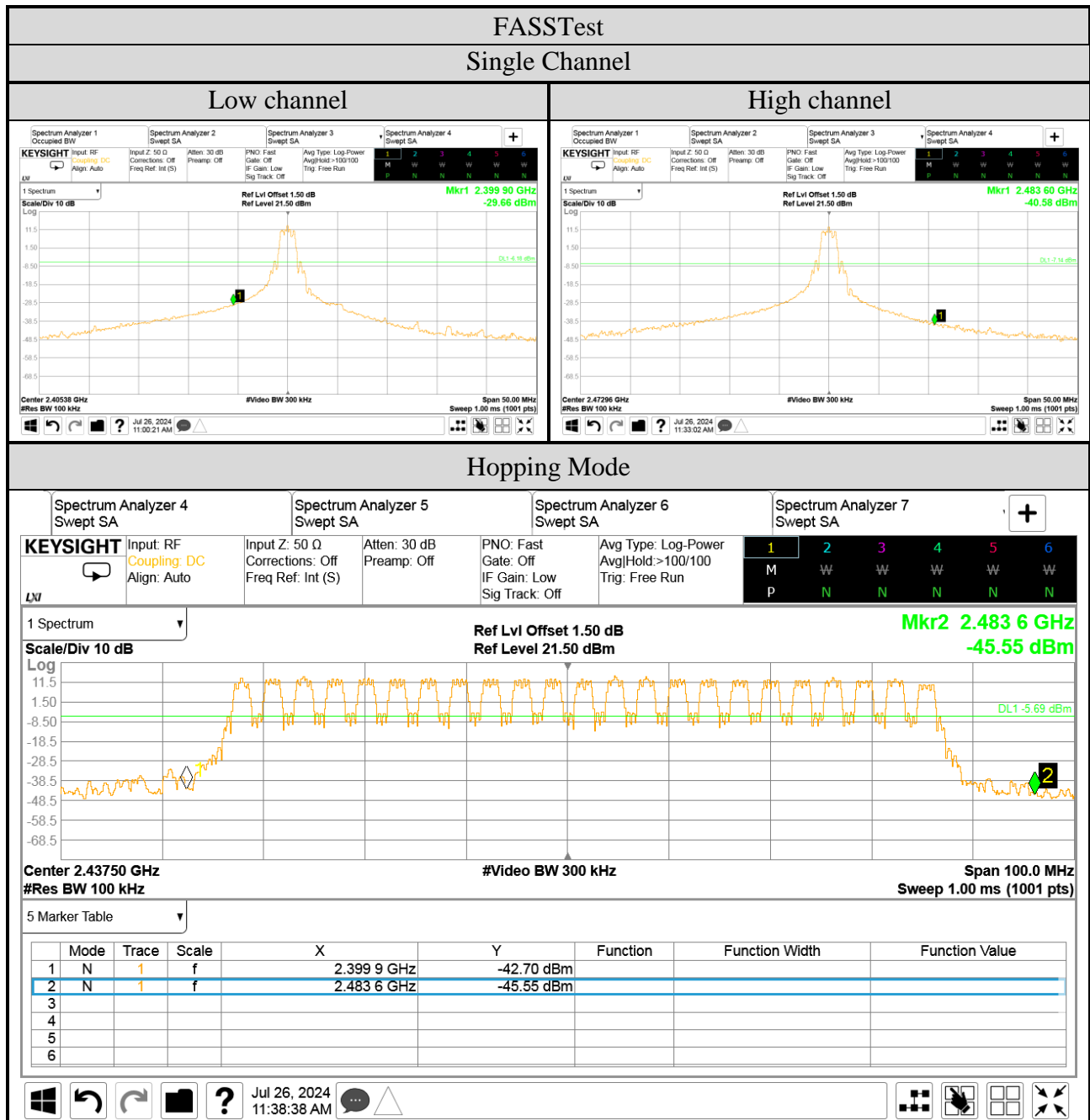


A.8 EMISSION LIMITATIONS MEASUREMENT

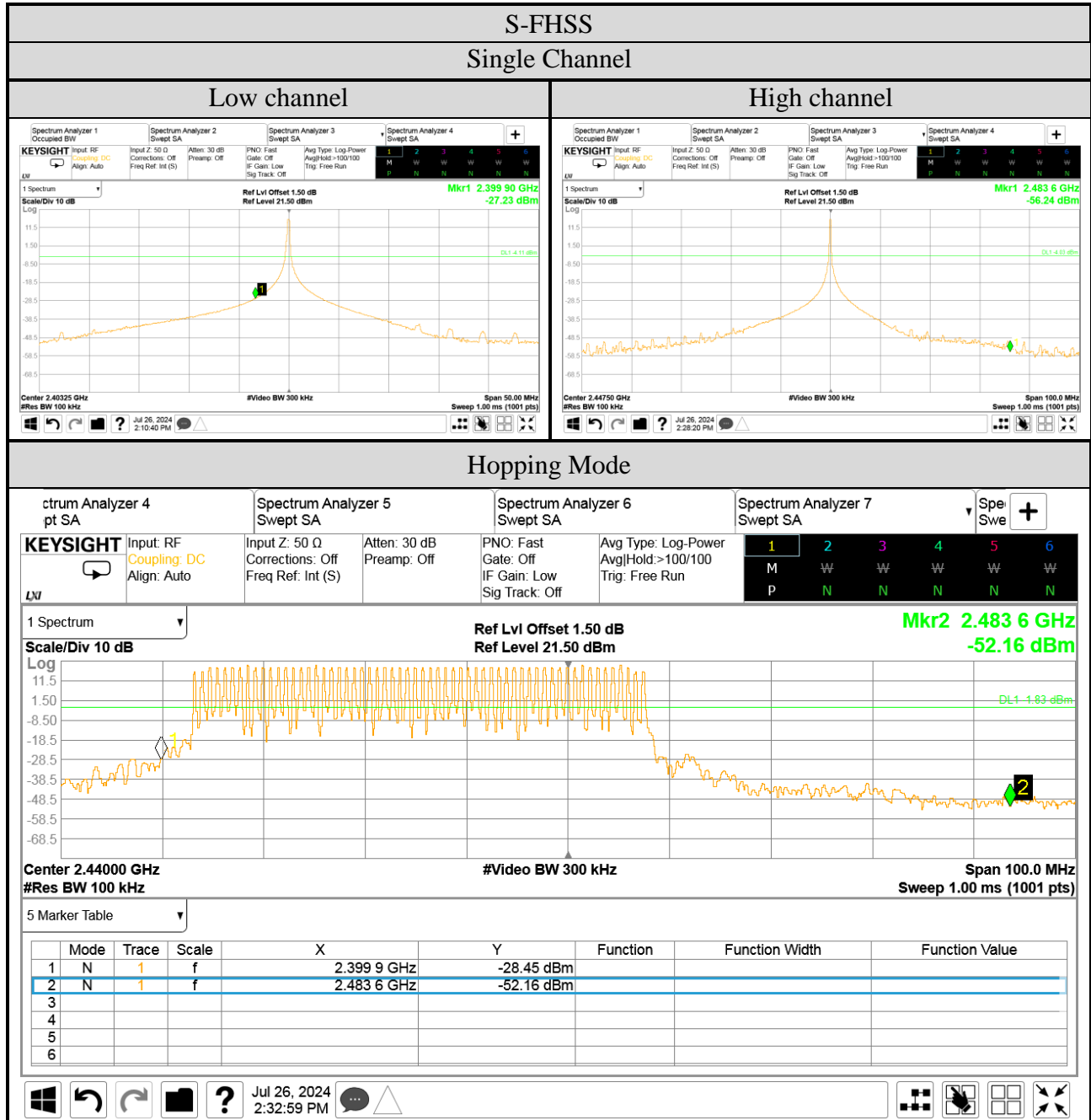
A.8.1 Band Edge

Test Date	2024/07/26	Temp./Hum.	24°C/54%
Cable Loss	1.50 dB	Tested By	Sean Wang
Test Voltage	DC 7.4V (Via Battery)		

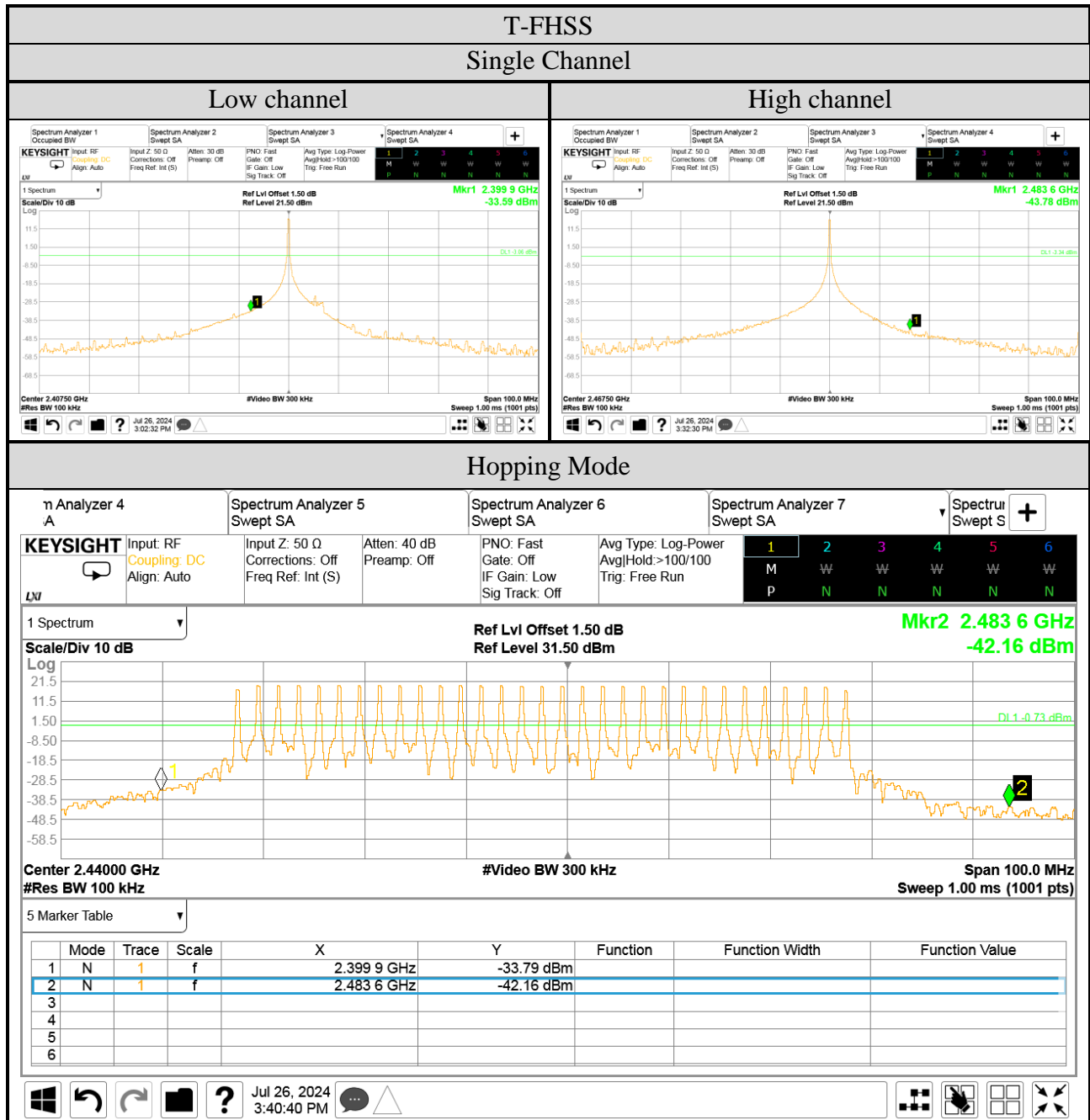
Test Mode: #1 With TC57A RF Module



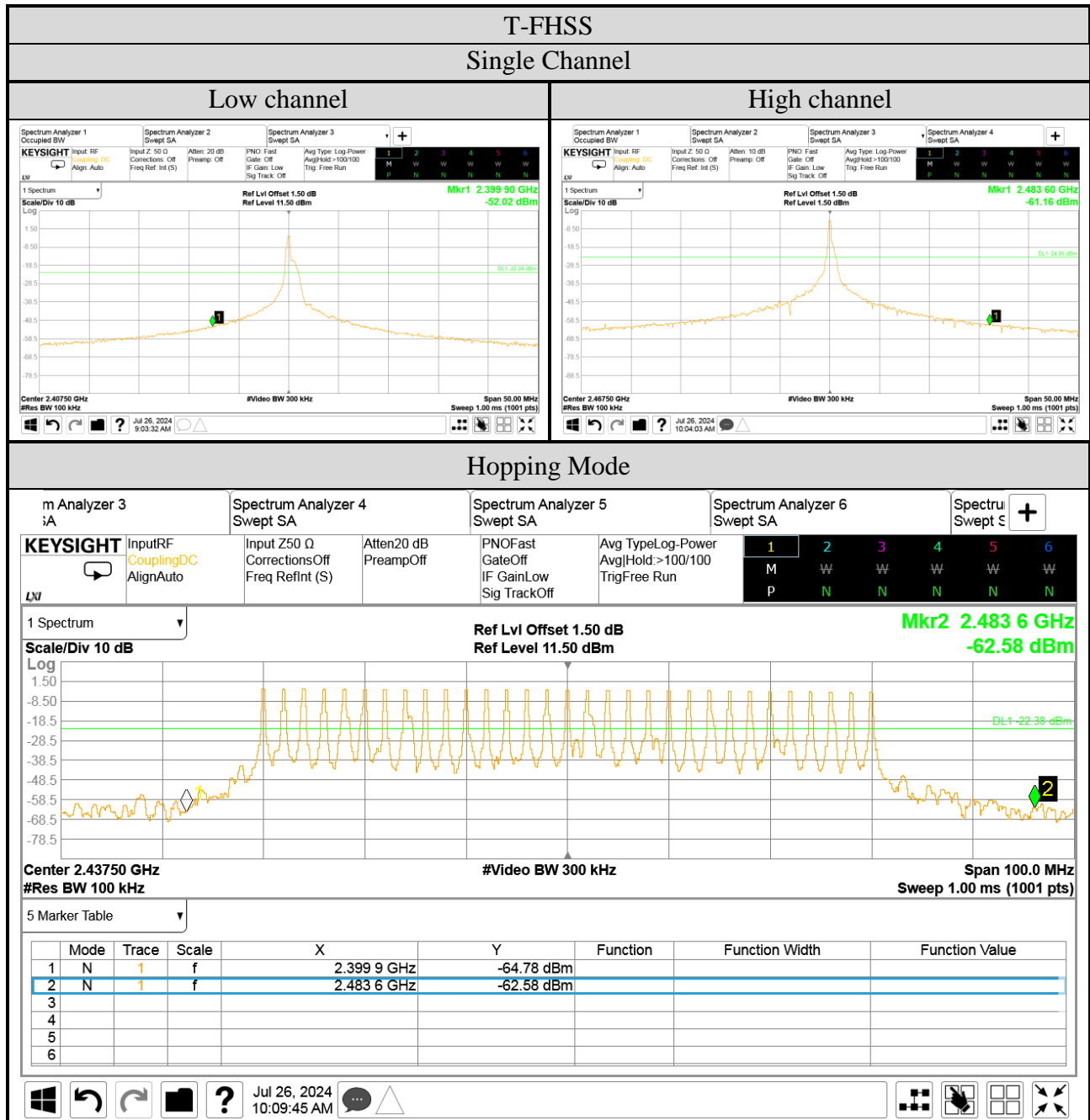
Test Mode: #1 With TC57A RF Module



Test Mode: #1 With TC57A RF Module



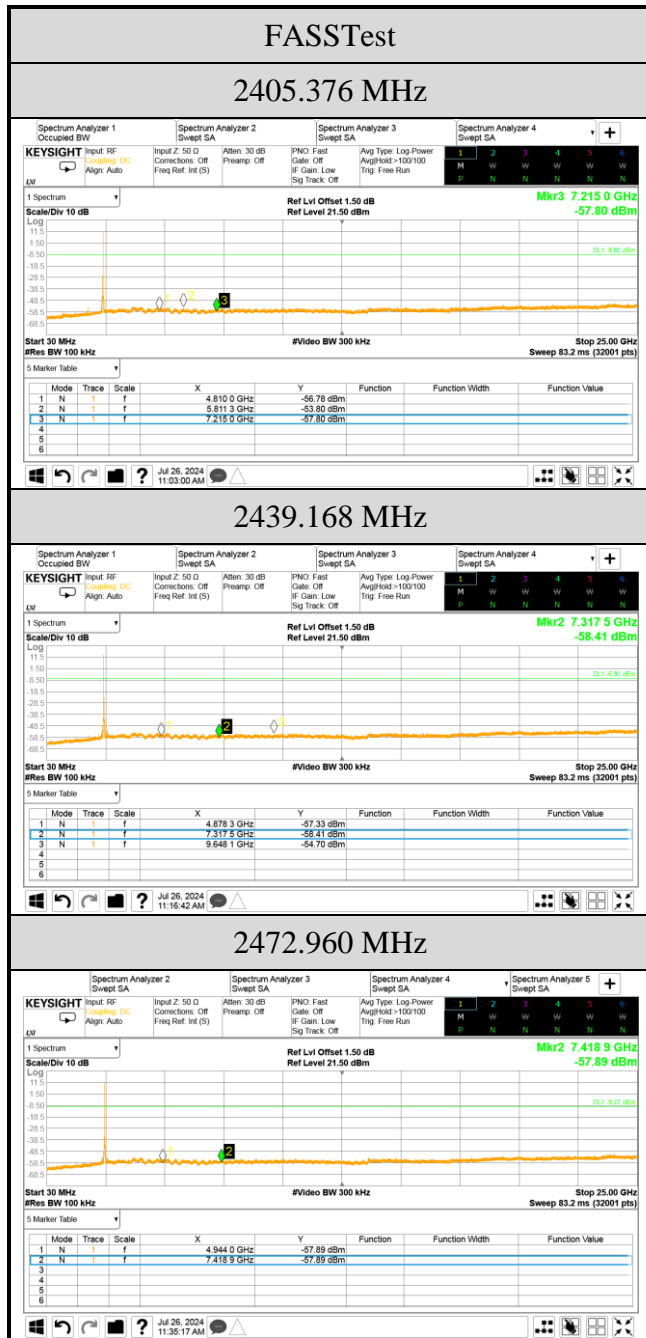
Test Mode: #2 With WTR-16 RF Board



A.8.2 Spurious Emission

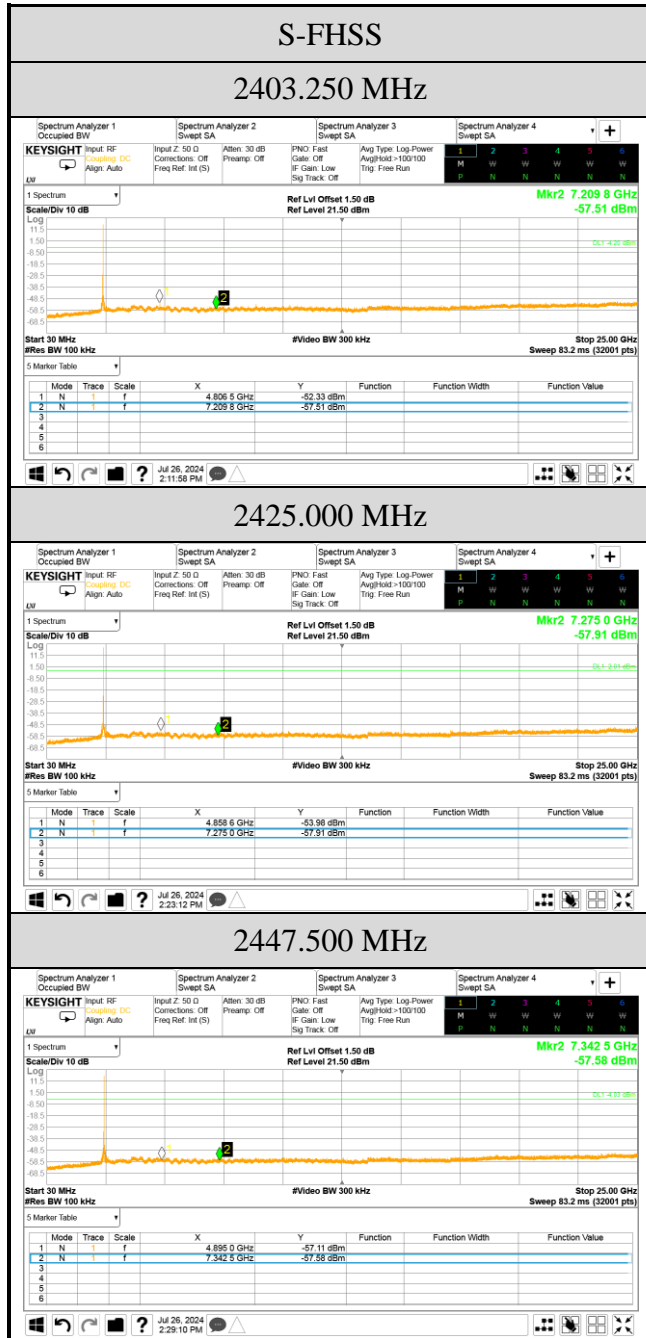
Test Date	2024/07/26	Temp./Hum.	24°C/54%
Cable Loss	1.50 dB	Tested By	Sean Wang
Test Voltage	DC 7.4V (Via Battery)		

Test Mode: #1 With TC57A RF Module



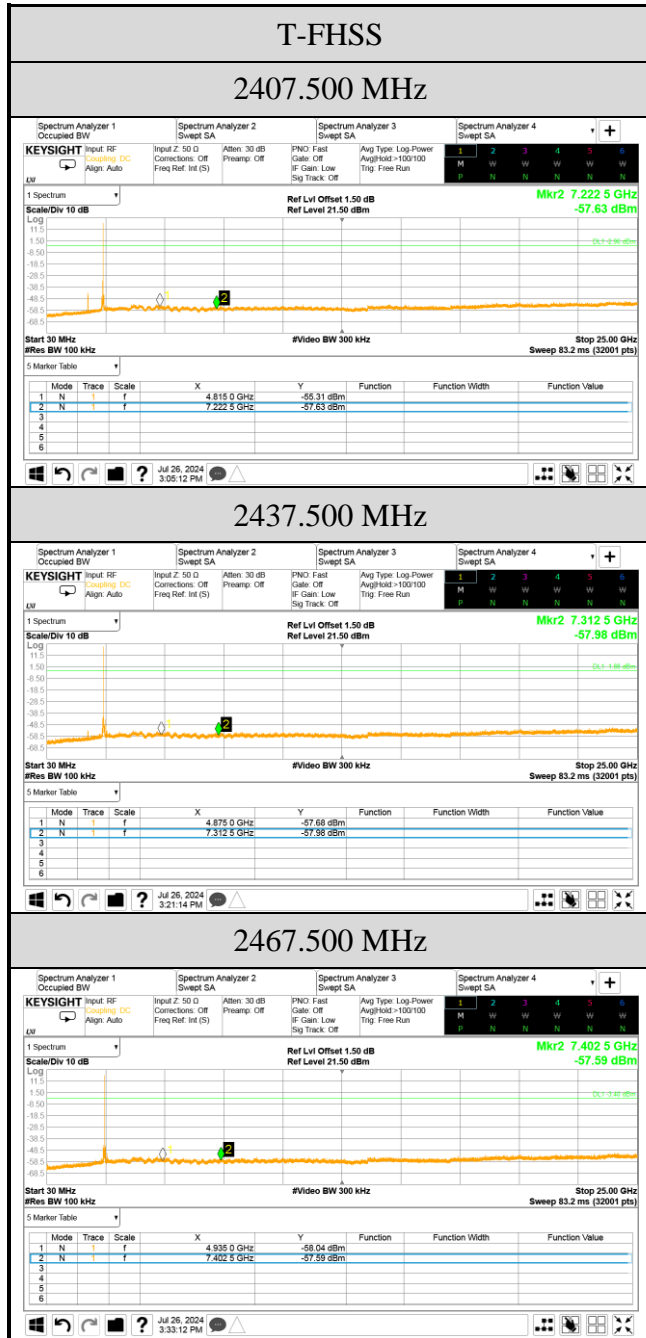
Note: All results have been included cable loss.

Test Mode: #1 With TC57A RF Module



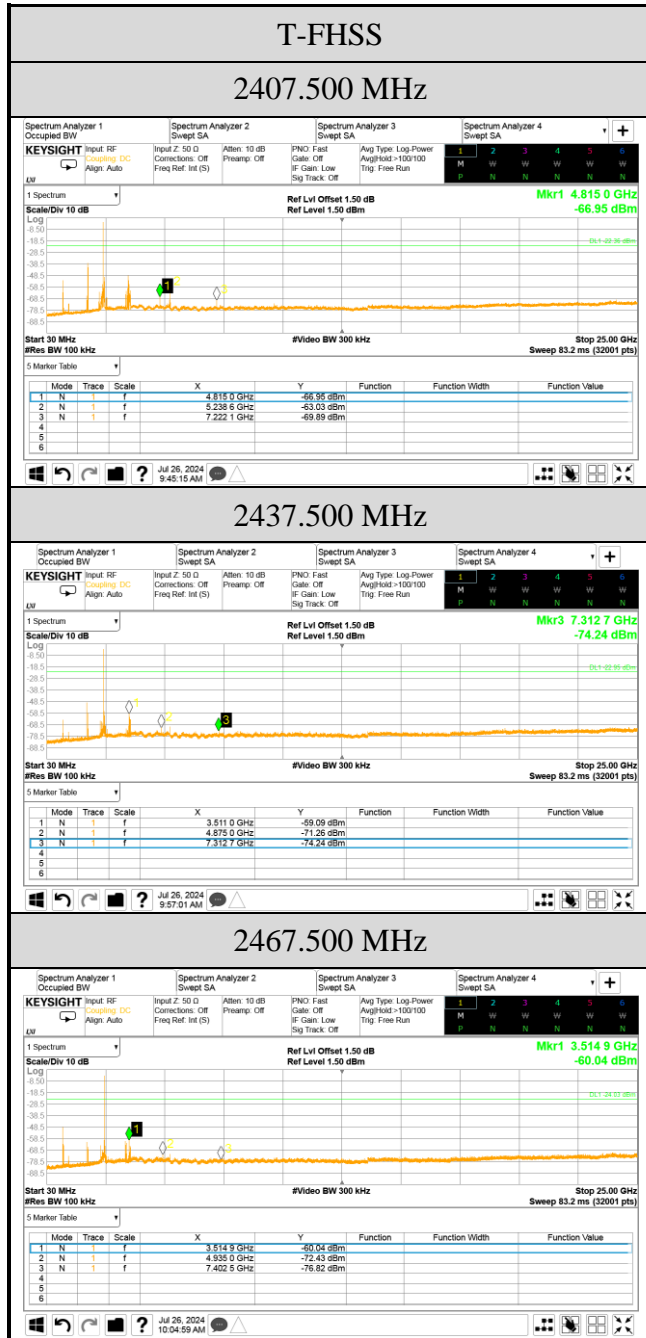
Note: All results have been included cable loss.

Test Mode: #1 With TC57A RF Module



Note: All results have been included cable loss.

Test Mode: #2 With WTR-16 RF Board



Note: All results have been included cable loss.

A.9 DTS/Occupied Bandwidth

Test Date	2024/07/30	Temp./Hum.	23°C/57%
Cable Loss	1.20 dB	Tested By	Sean Wang
Test Voltage	DC 7.4V (Via Battery)		

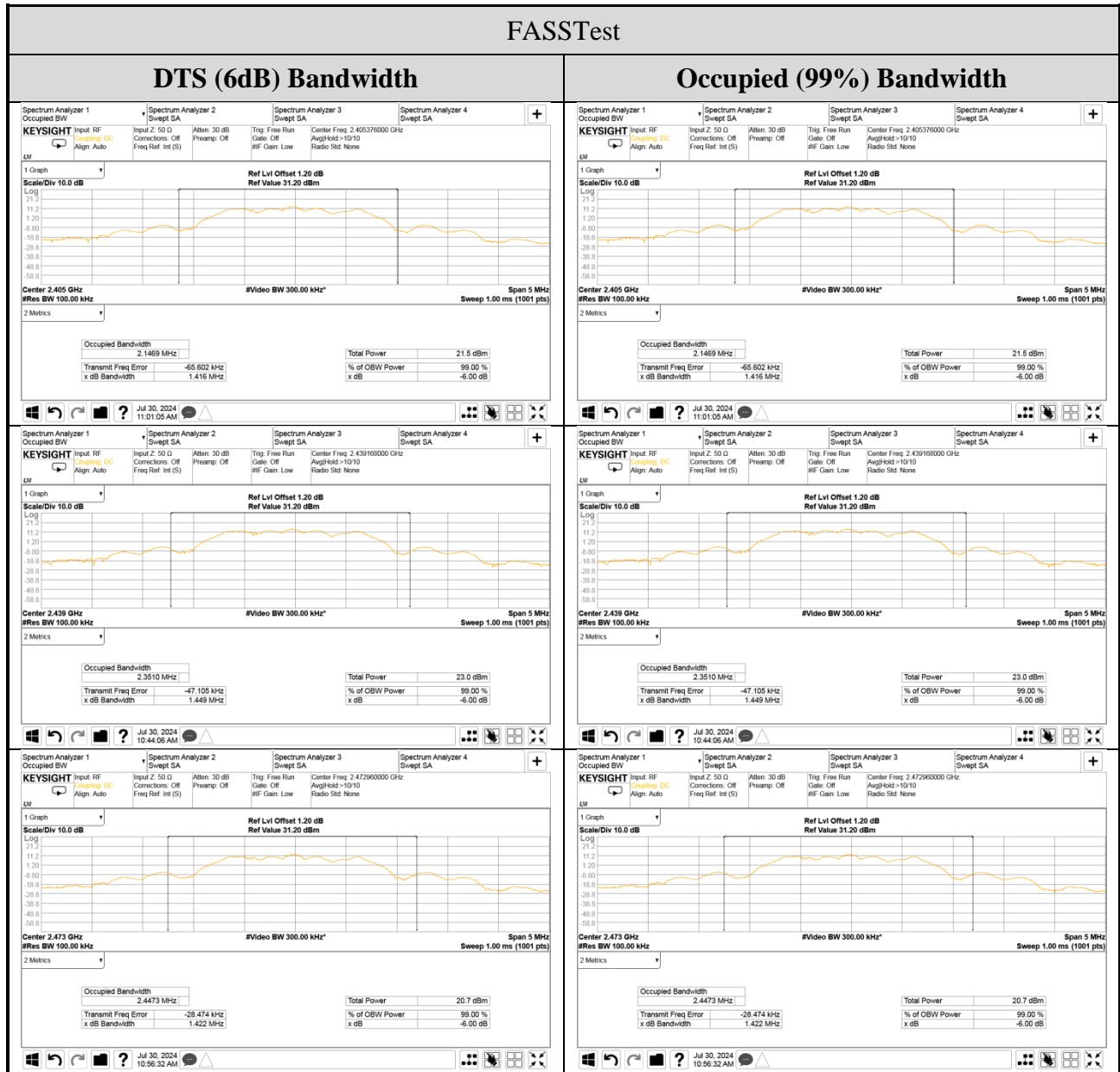
A.9.1 DTS/Occupied Bandwidth Result

Test Mode: #1 With TC57A RF Module

Mode	Centre Frequency (MHz)	DTS (6dB) Bandwidth (MHz)	Occupied (99%) Bandwidth (MHz)	Limit
FASSTest	2405.376	1.416	2.1469	>500kHz
	2439.168	1.449	2.3510	
	2472.960	1.442	2.4473	

A.9.2 Measurement Plots

● **Test Mode: #1 With TC57A RF Module**



A.10 POWER SPECTRAL DENSITY

Test Date	2024/07/30	Temp./Hum.	23°C/57%
Cable Loss	1.20 dB	Tested By	Sean Wang
Test Voltage	DC 7.4V (Via Battery)		

A.10.1 Power Spectral Density Result

Test Mode: #1 With TC57A RF Module

Mode	Centre Frequency (MHz)	Power Spectral Density (dBm)	Limit
FASSTest	2405.376	4.51	<8 dBm/3kHz
	2439.168	7.30	
	2472.960	3.53	

A.10.2 Measurement Plots

● **Test Mode: #1 With TC57A RF Module**



Note: All results have been included cable loss.