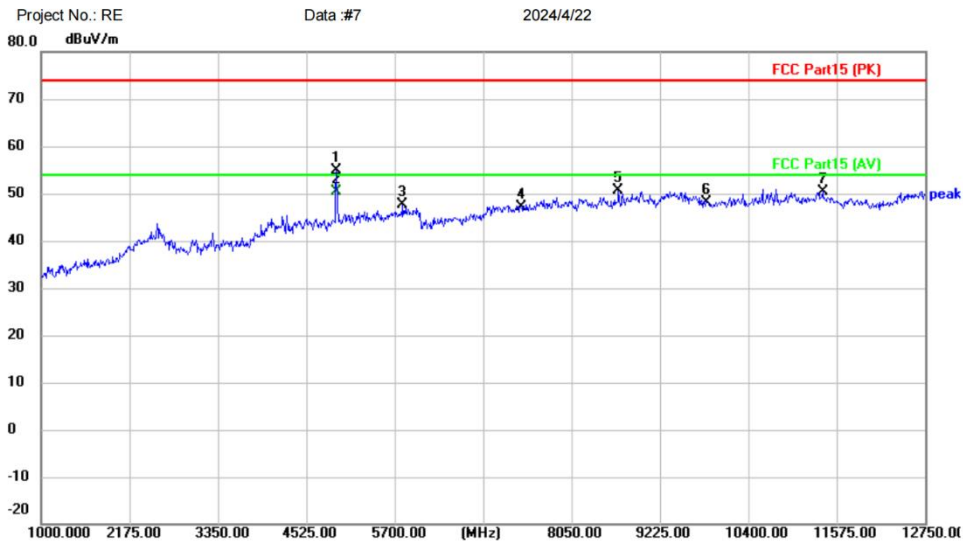


[Test mode: TX High channel]; [Polarity: Horizontal]

Radiated Emission Measurement



Site Polarization: **Horizontal** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: Smart Fish Tank
M/N: S1
Mode: 2.4Gwifi 11B-TX-2462
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.500	48.78	6.10	54.88	74.00	-19.12	peak	
2	*	4924.500	44.39	6.10	50.49	54.00	-3.51	AVG	
3		5805.750	39.59	7.99	47.58	74.00	-26.42	peak	
4		7386.000	37.65	9.37	47.02	74.00	-26.98	peak	
5		8672.750	39.34	11.40	50.74	74.00	-23.26	peak	
6		9848.000	35.78	12.31	48.09	74.00	-25.91	peak	
7		11387.000	37.87	12.63	50.50	74.00	-23.50	peak	

*:Maximum data x:Over limit !:over margin

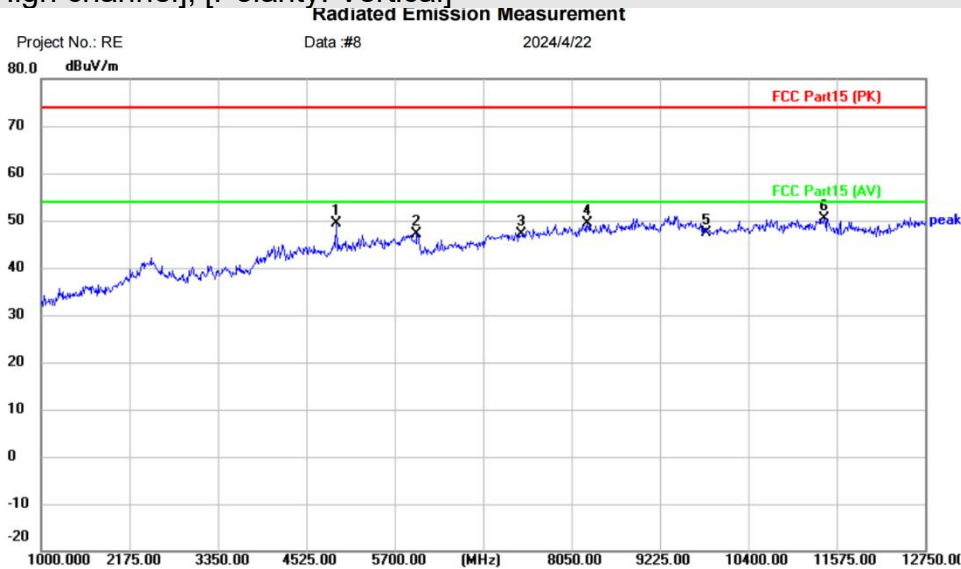
<Reference Only

Receiver: ESR_1

Spectrum Analyzer: FSP40

Test Result: Pass

[Test mode: TX High channel]; [Polarity: Vertical]



Site: Polarization: **Vertical** Temperature: (C)
 Limit: FCC Part15 (PK) Power: Humidity: %RH
 EUT: Smart Fish Tank
 M/N: S1
 Mode: 2.4Gwifi 11B-TX-2462
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4924.500	43.21	6.10	49.31	74.00	-24.69	peak	
2		5993.750	38.33	8.75	47.08	74.00	-26.92	peak	
3		7386.000	37.71	9.37	47.08	74.00	-26.92	peak	
4		8261.500	39.36	9.95	49.31	74.00	-24.69	peak	
5		9848.000	35.07	12.31	47.38	74.00	-26.62	peak	
6	*	11410.50	37.79	12.61	50.40	74.00	-23.60	peak	

*:Maximum data x:Over limit !:over margin <Reference Only

Receiver: ESR_1 Spectrum Analyzer: FSP40

Test Result: Pass

6.9 Radiated emissions which fall in the restricted bands

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX

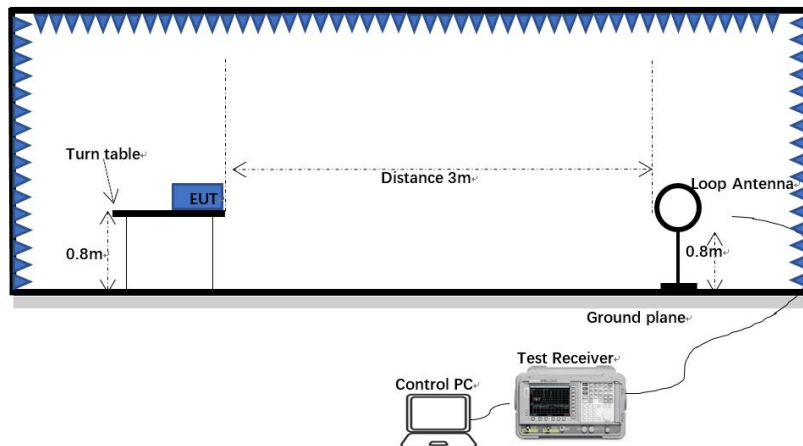
6.9.1 Limit

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

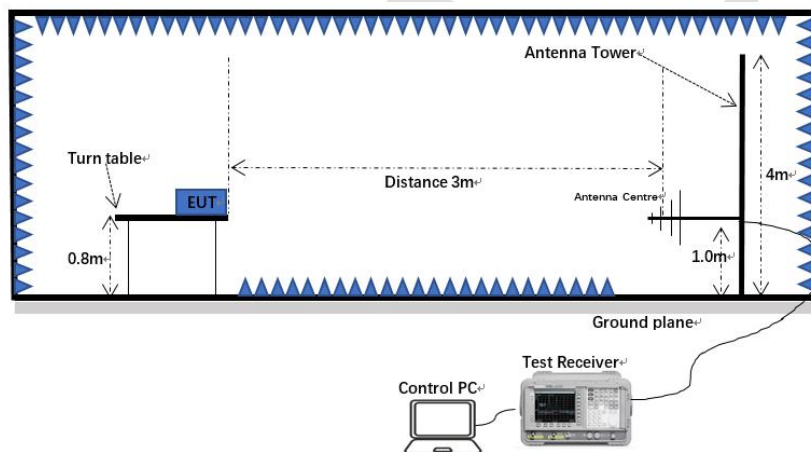
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

6.9.2 Test setup

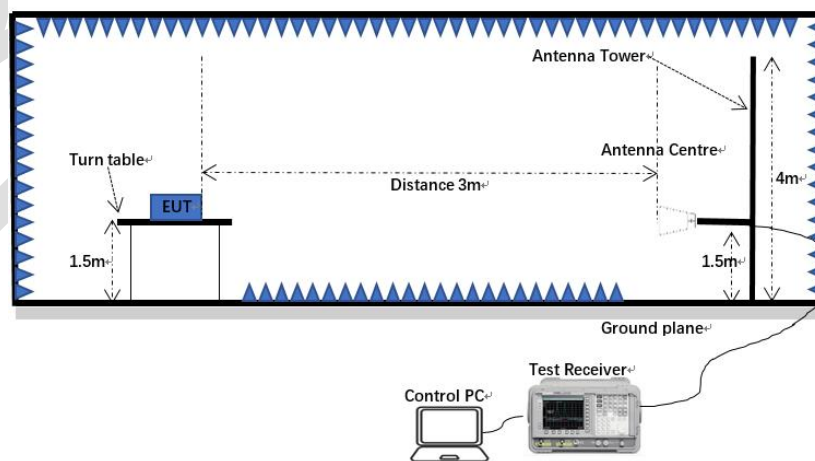
Below 1GHz:



30MHz-1GHz:



Above 1GHz:



6.9.3 Procedure

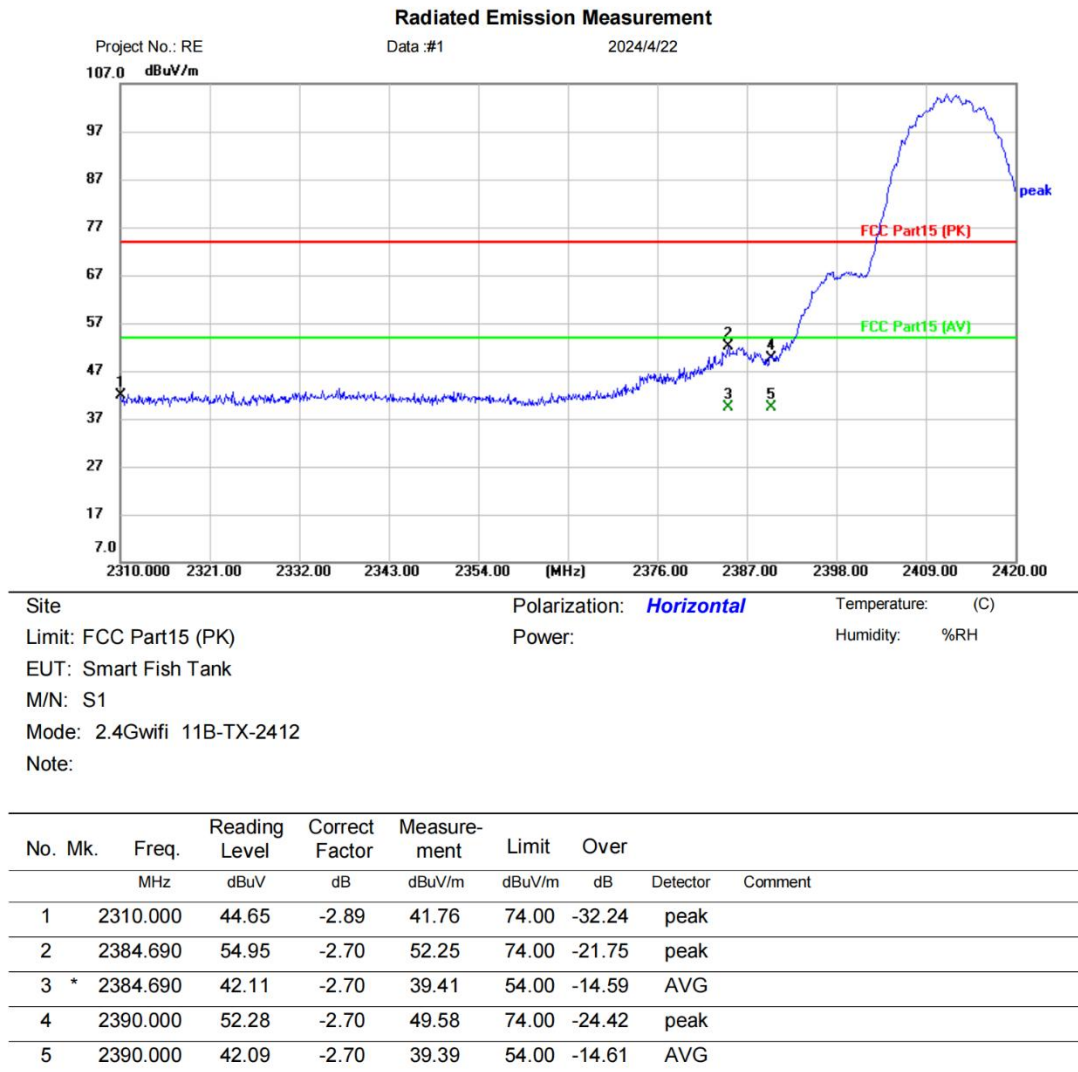
- a) For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c) The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h) Test the EUT in the lowest channel, the middle channel, the highest channel.
- i) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j) Repeat above procedures until all frequencies measured was complete.

Note 1: Level (dBuV) = Reading (dBuV) + Factor (dB/m)

Note 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

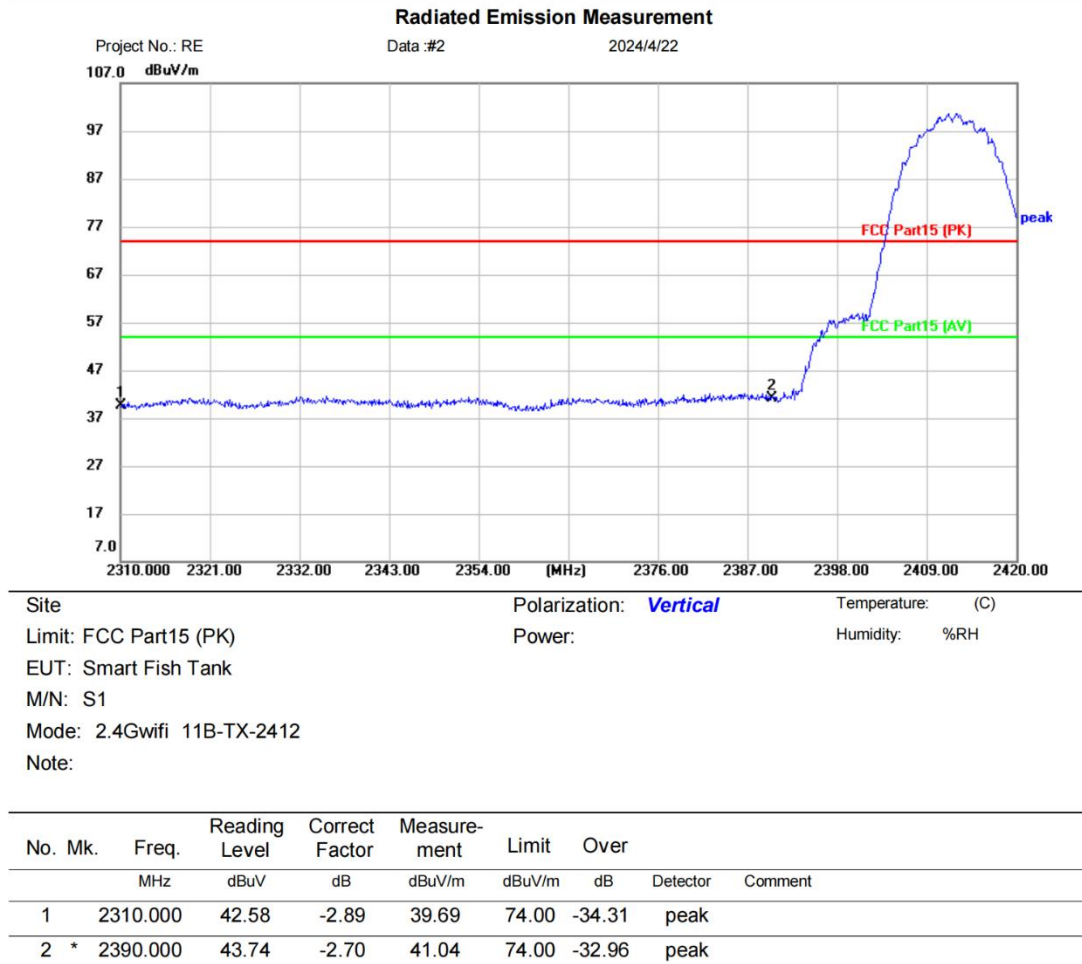
6.9.4 Test data

[Test mode: TX b low channel]; [Polarity: Horizontal]



Test Result: Pass

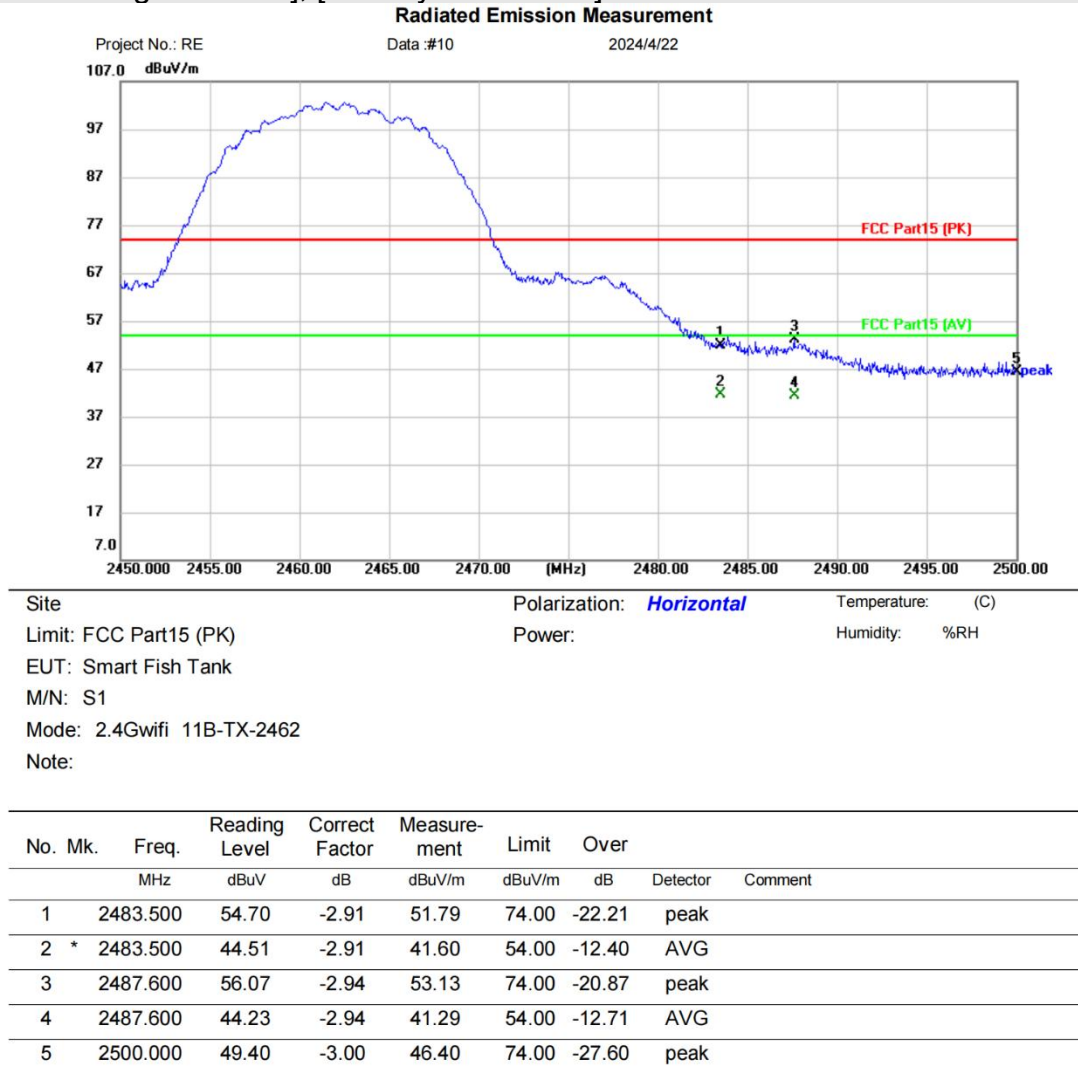
[Test mode: TX b low channel]; [Polarity: Vertical]



*:Maximum data x:Over limit !:over margin <Reference Only

Test Result: Pass

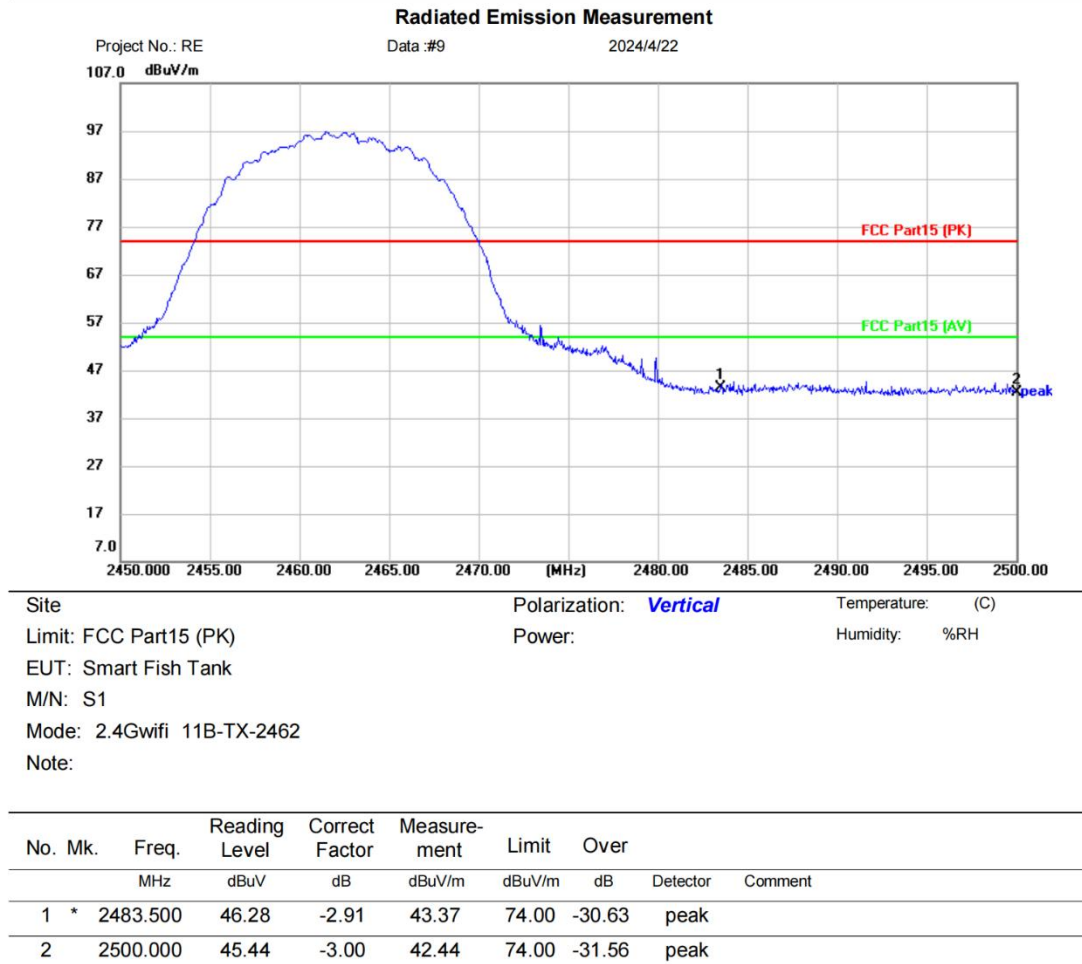
[Test mode: TX b High channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin <Reference Only

Test Result: Pass

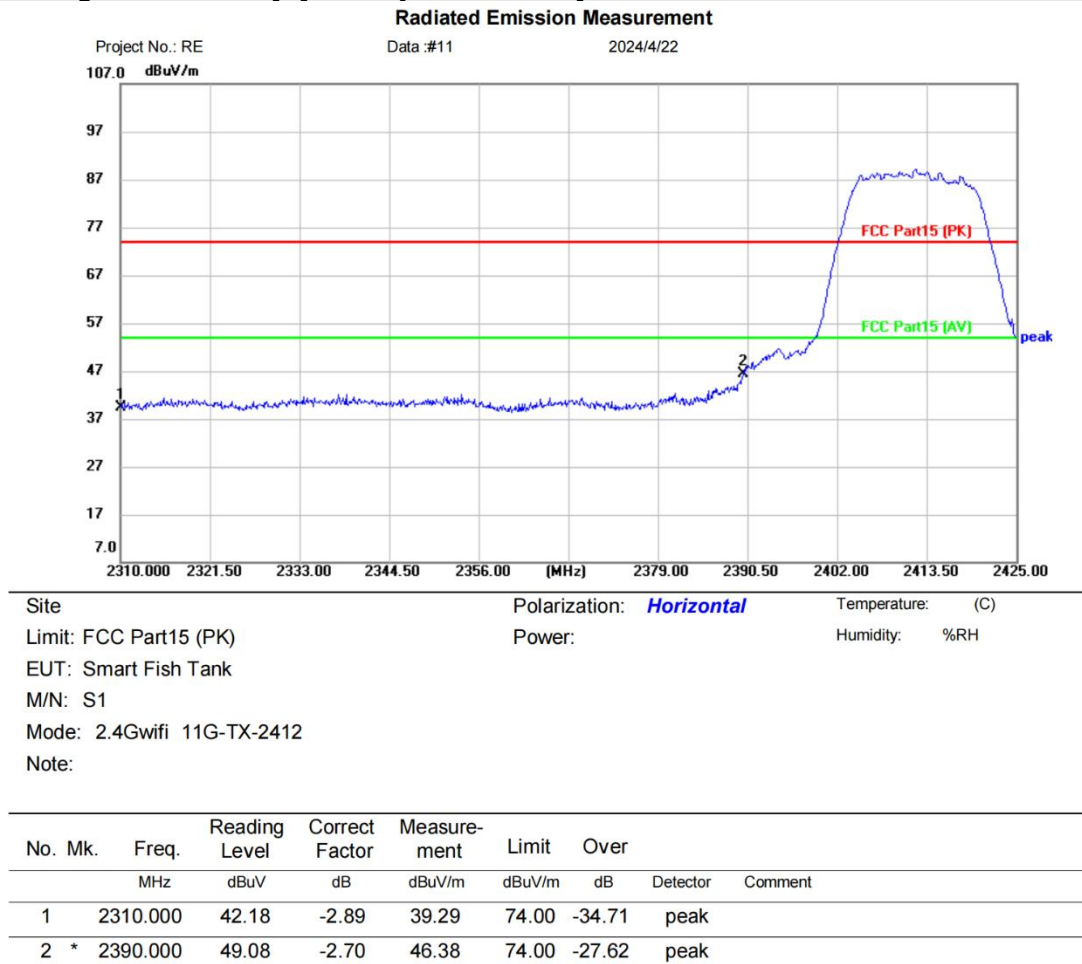
[Test mode: TX b High channel]; [Polarity: Vertical]



*:Maximum data x:Over limit !:over margin <Reference Only

Test Result: Pass

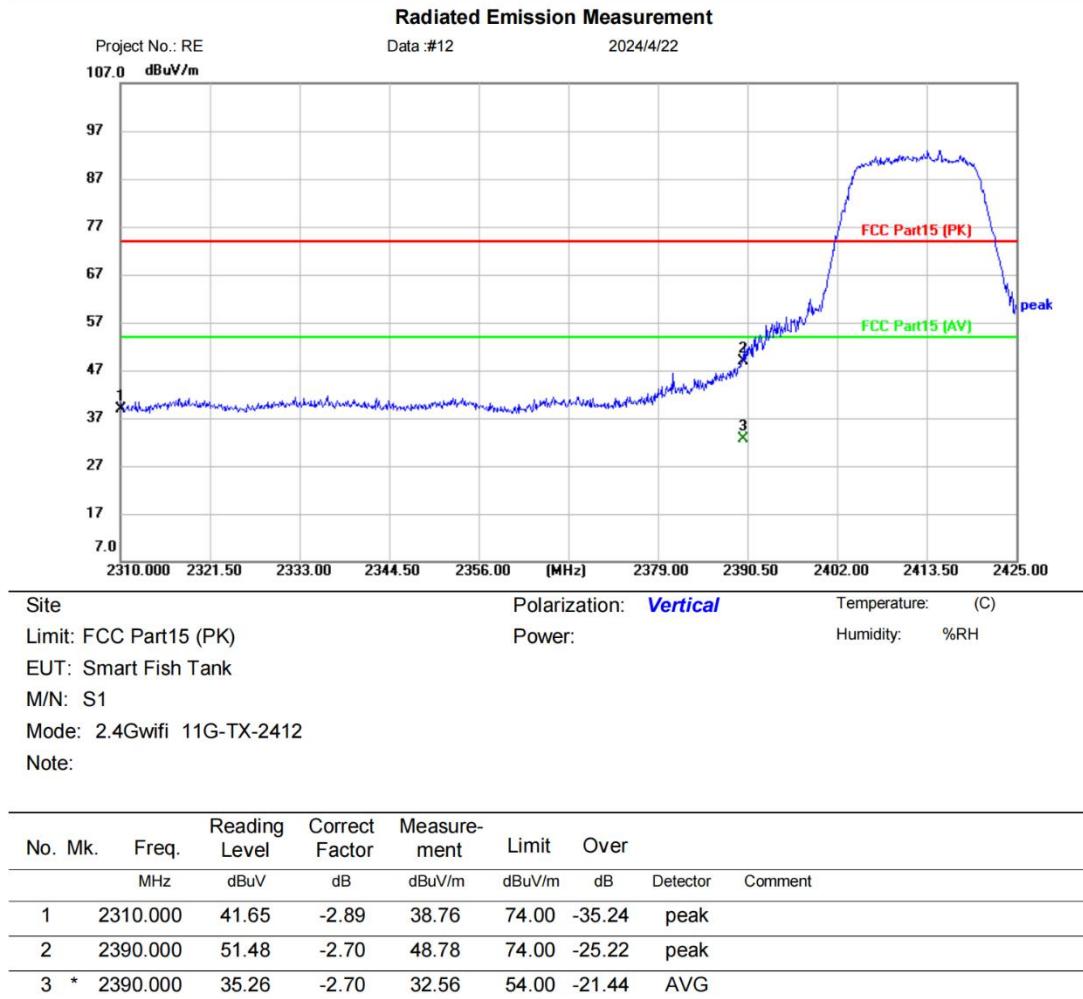
[Test mode: TX g low channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin <Reference Only

Test Result: Pass

[Test mode: TX g low channel]; [Polarity: Vertical]

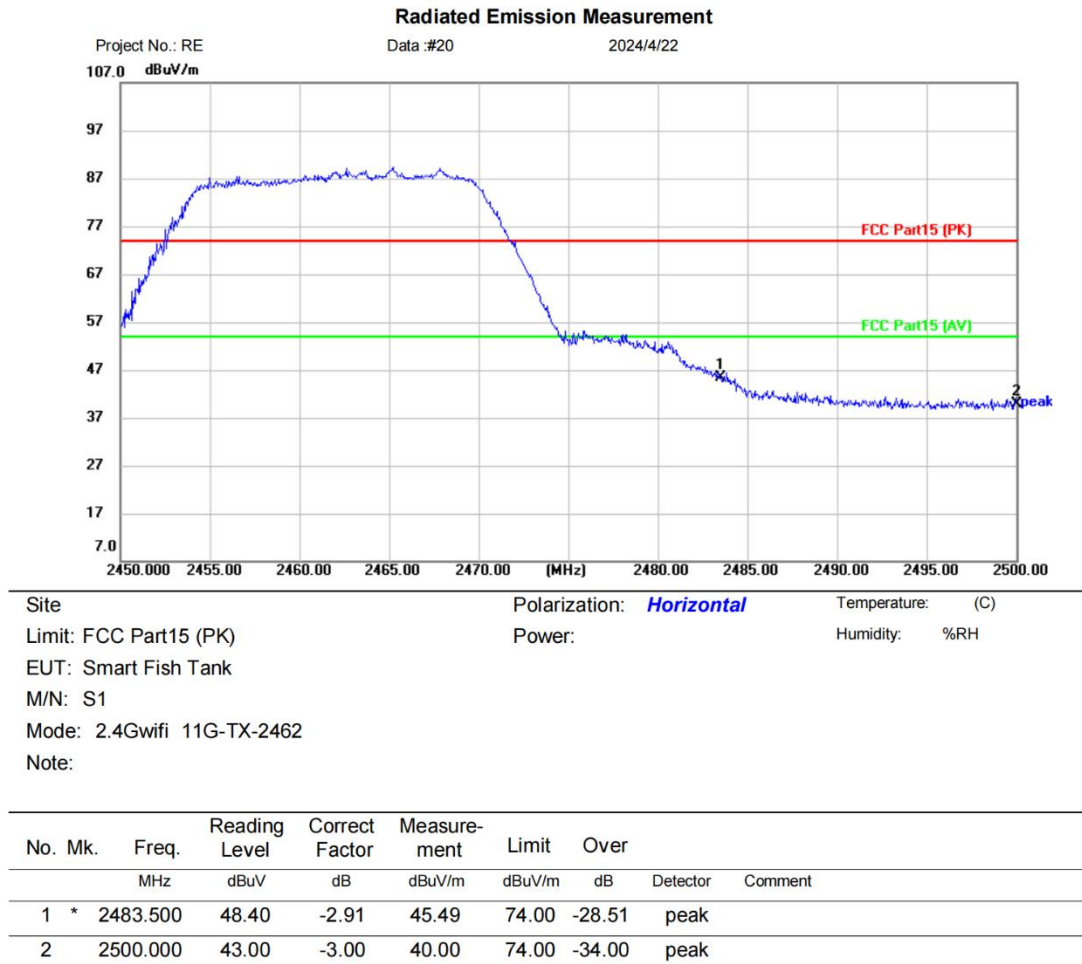


*:Maximum data x:Over limit !:over margin

<Reference Only

Test Result: Pass

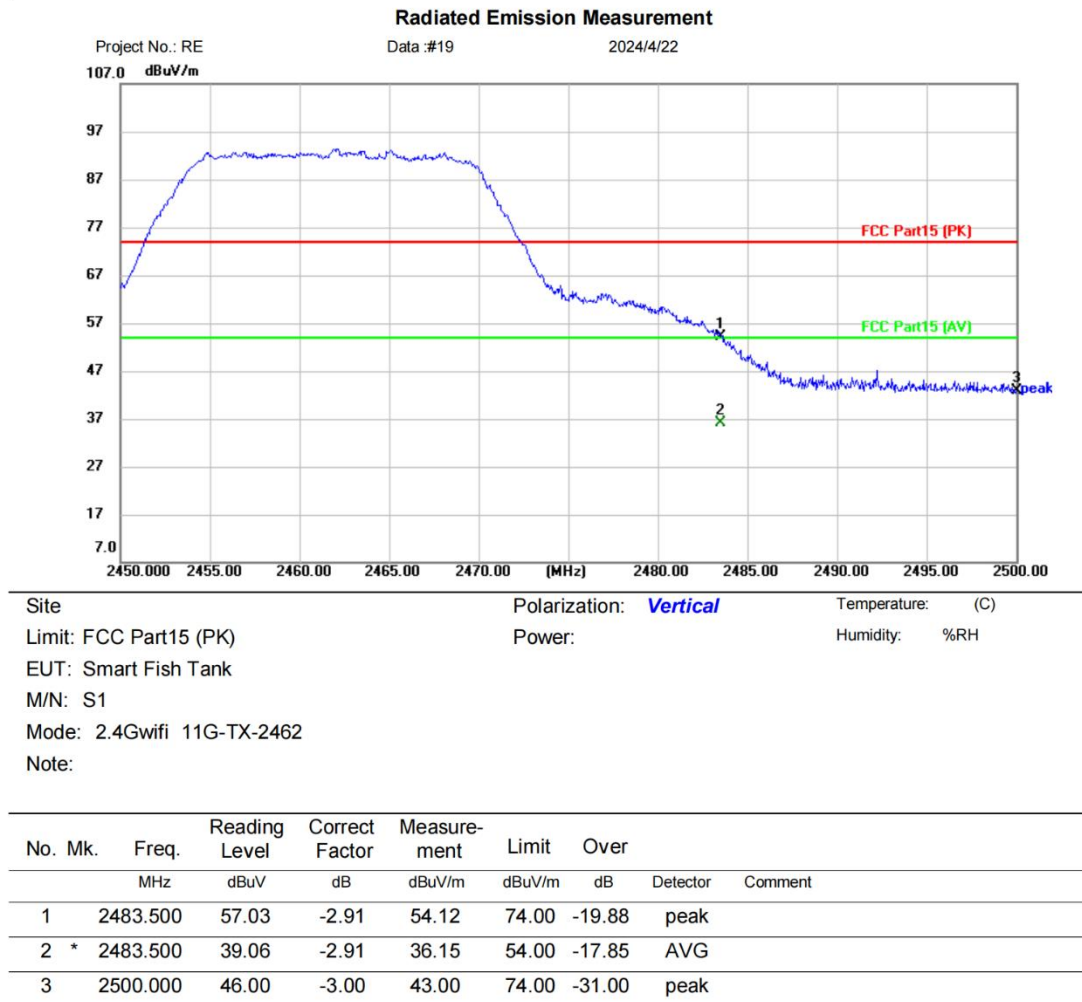
[Test mode: TX g High channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin <Reference Only

Test Result: Pass

[Test mode: TX g High channel]; [Polarity: Vertical]

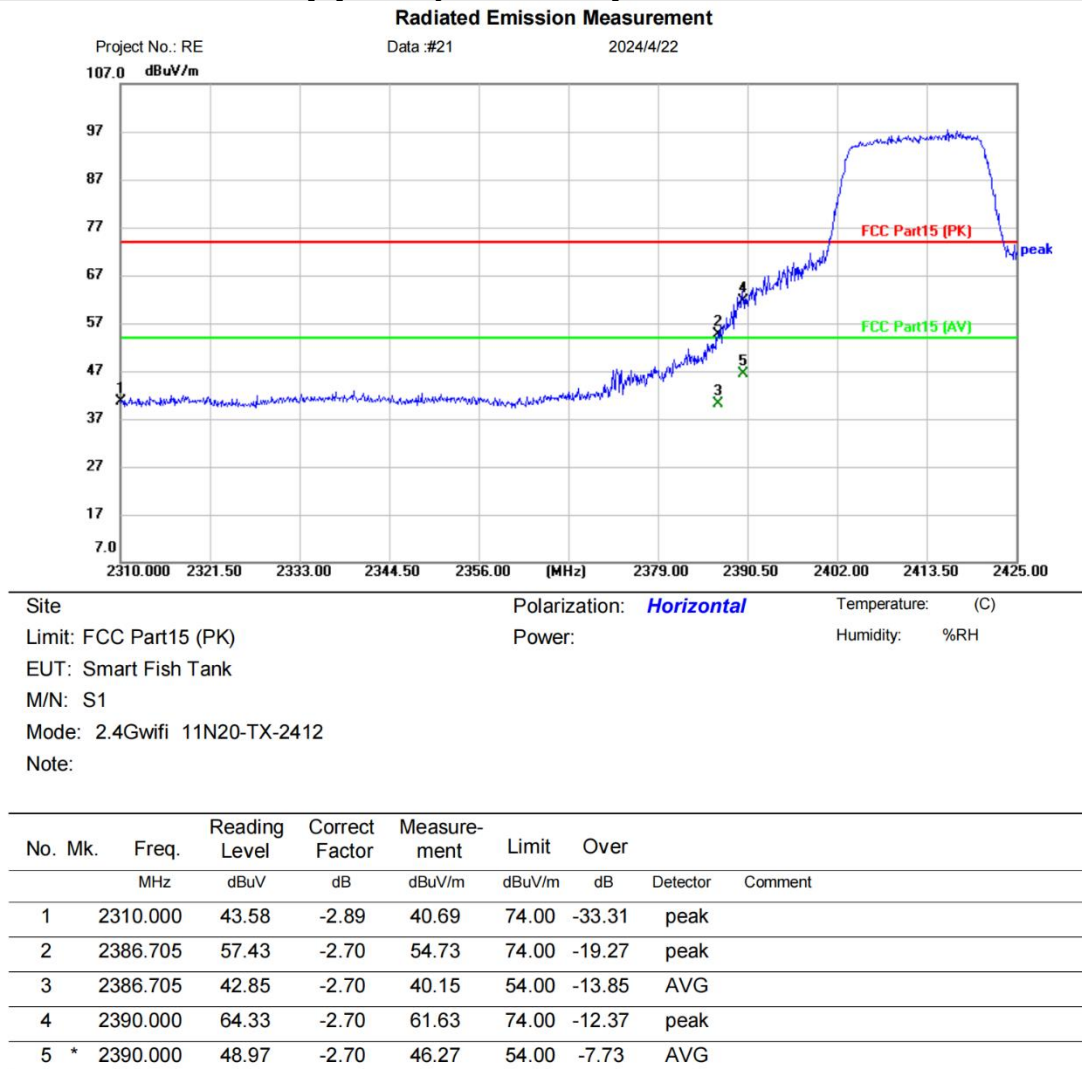


*:Maximum data x:Over limit !:over margin

⟨Reference Only

Test Result: Pass

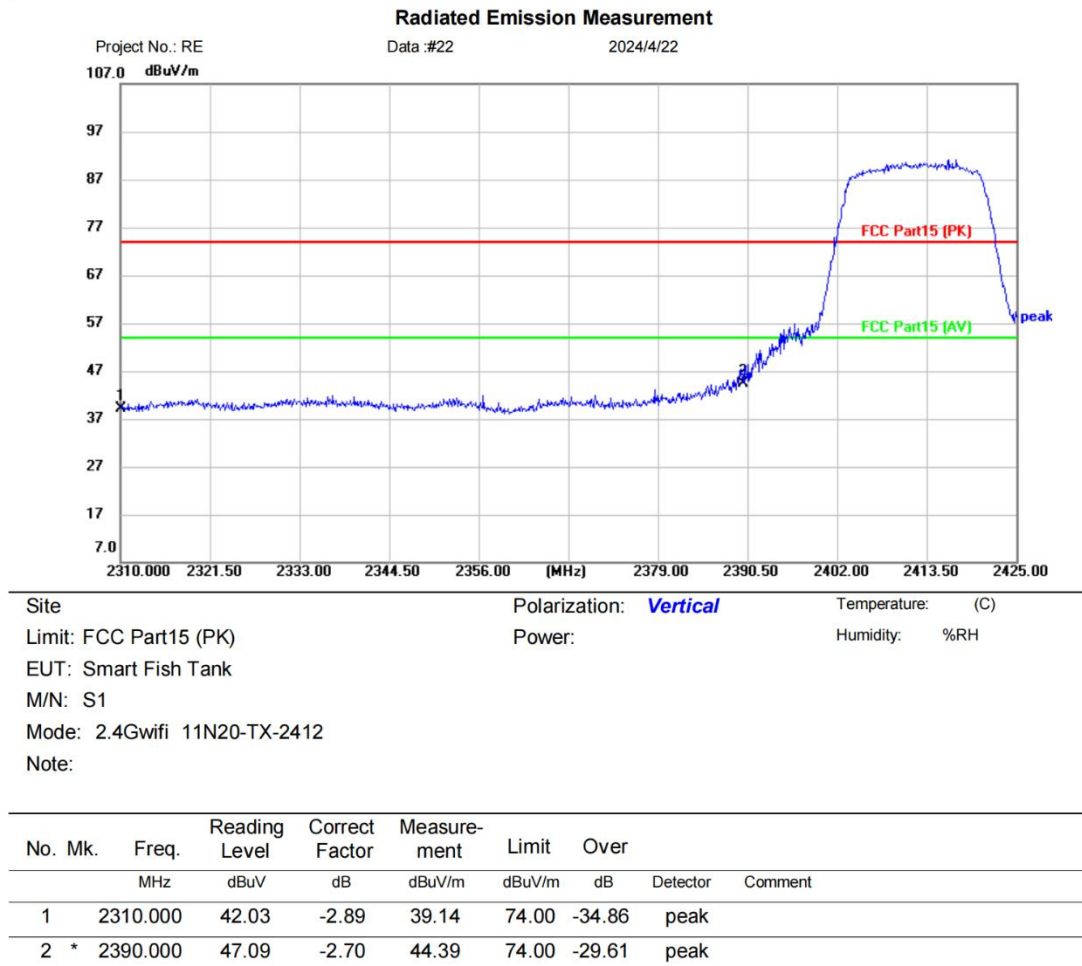
[Test mode: TX n20 low channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin <Reference Only

Test Result: Pass

[Test mode: TX n20 low channel]; [Polarity: Vertical]

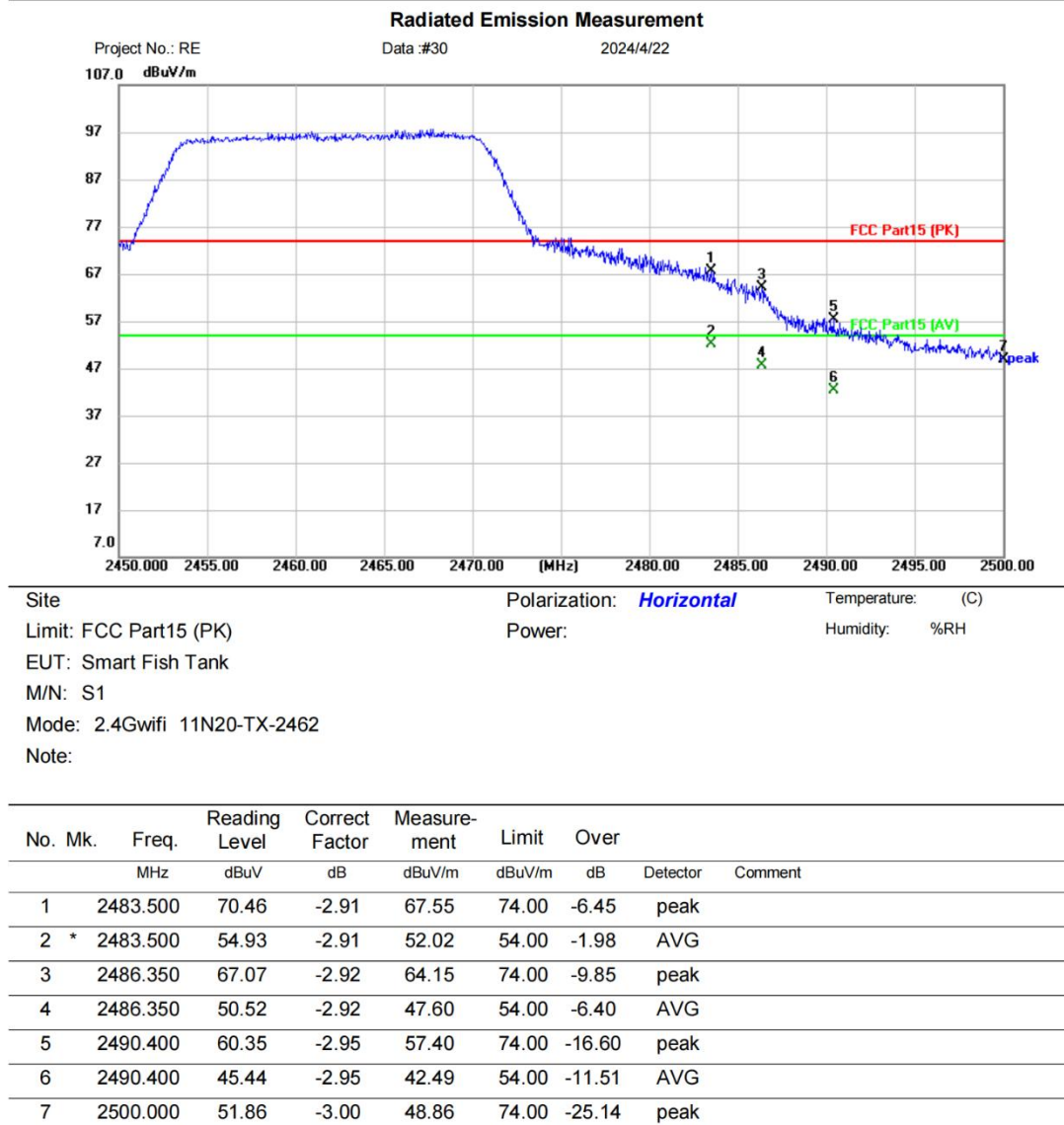


*:Maximum data x:Over limit !:over margin

⟨Reference Only

Test Result: Pass

[Test mode: TX n20 High channel]; [Polarity: Horizontal]

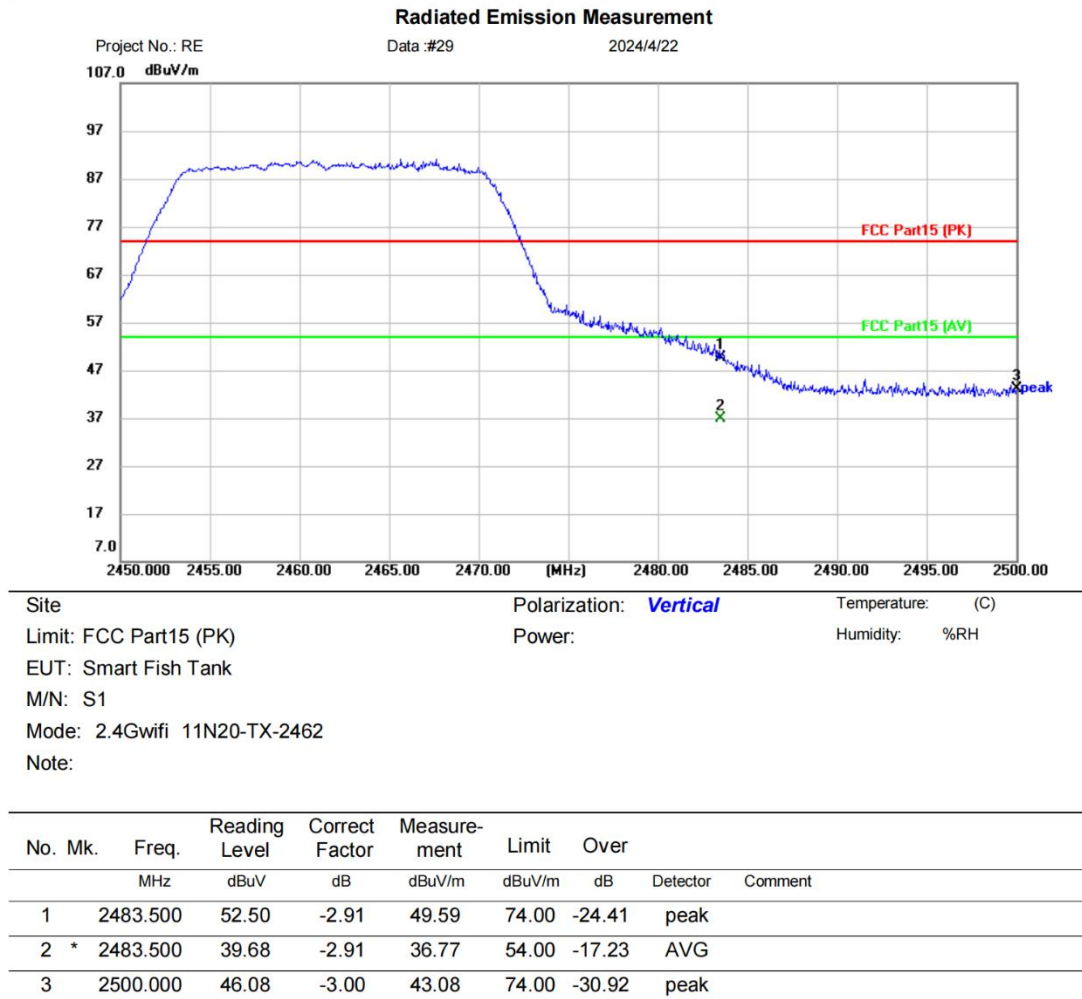


*:Maximum data x:Over limit !:over margin

<Reference Only

Test Result: Pass

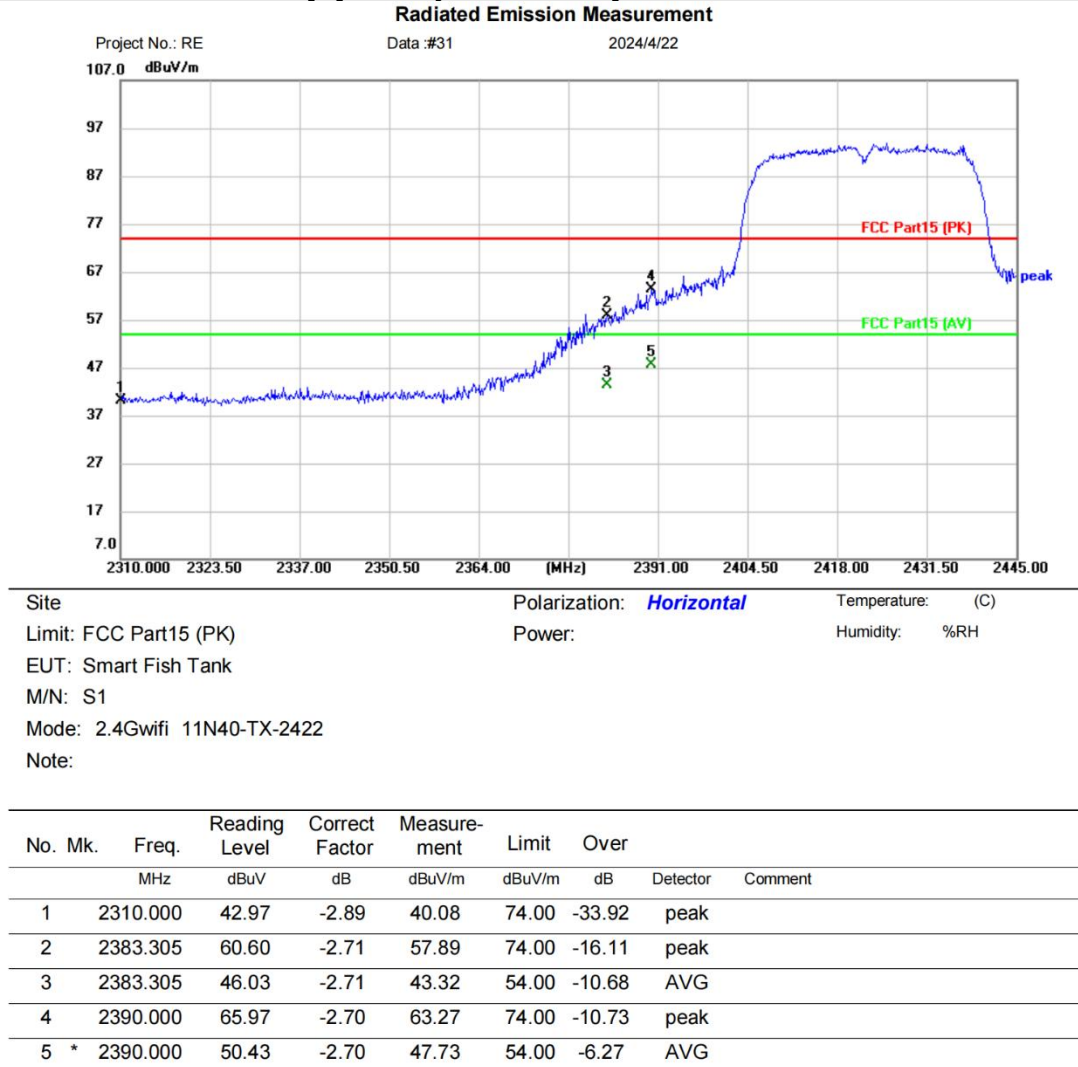
[Test mode: TX n20 High channel]; [Polarity: Vertical]



*:Maximum data x:Over limit !:over margin <Reference Only

Test Result: Pass

[Test mode: TX n40 low channel]; [Polarity: Horizontal]

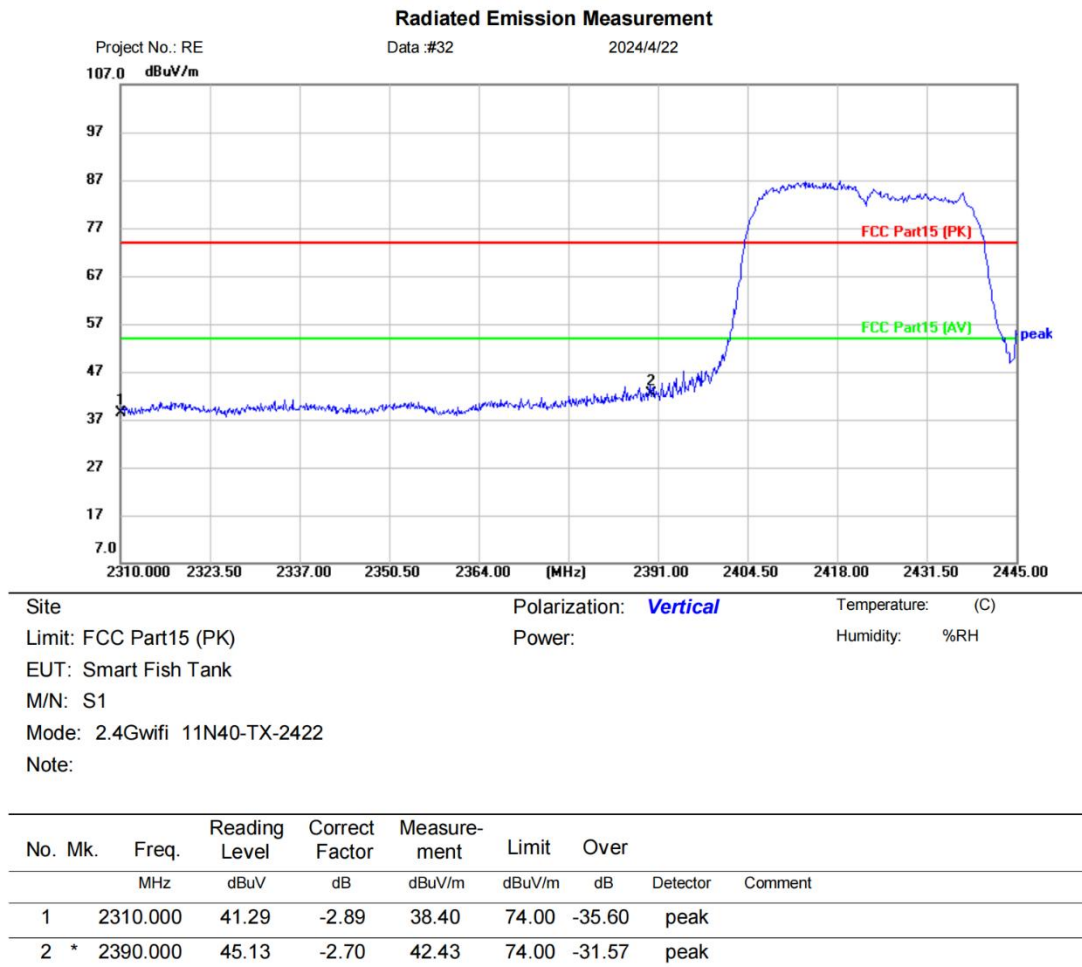


*:Maximum data x:Over limit !:over margin

<Reference Only

Test Result: Pass

[Test mode: TX n40 low channel]; [Polarity: Vertical]

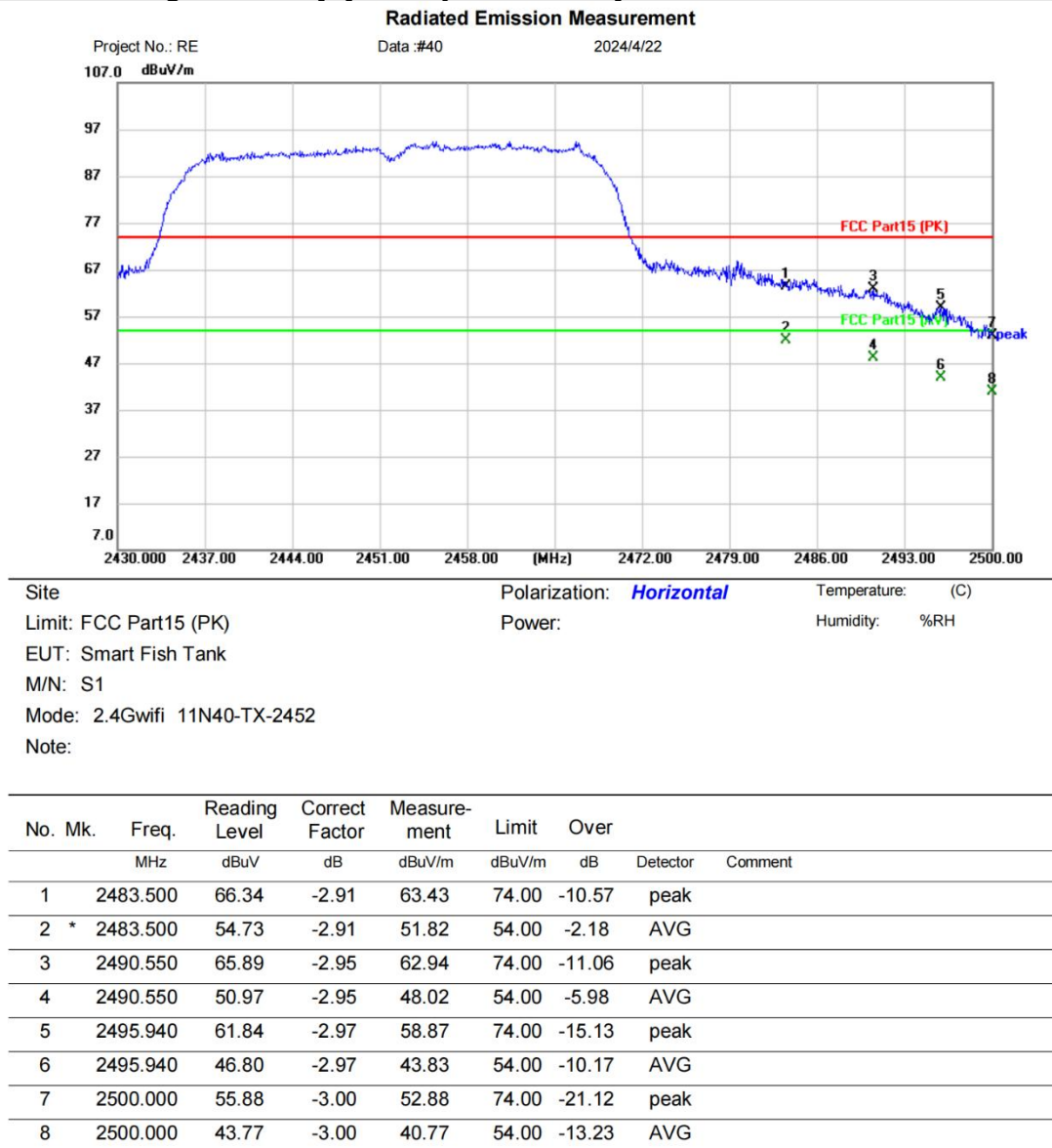


*:Maximum data x:Over limit !:over margin

<Reference Only

Test Result: Pass

[Test mode: TX n40 High channel]; [Polarity: Horizontal]

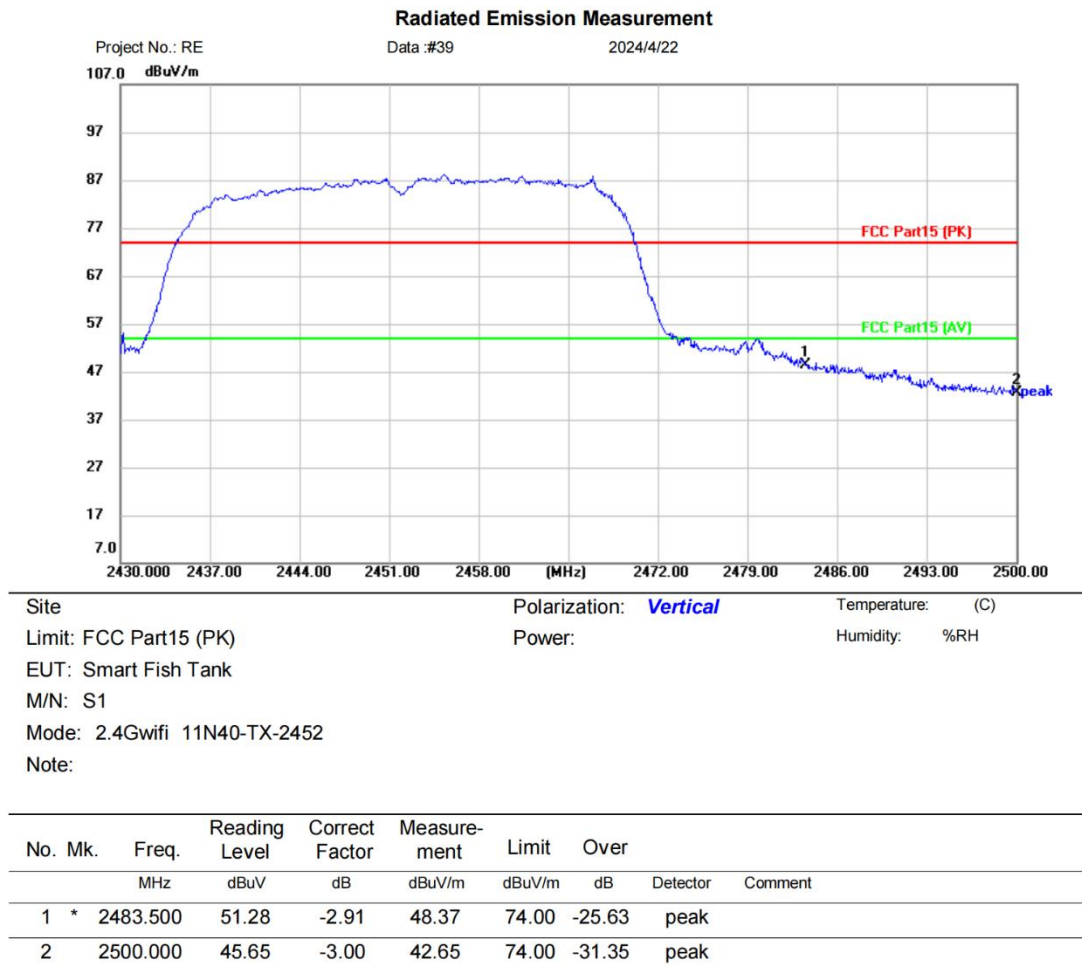


*:Maximum data x:Over limit !:over margin

⟨Reference Only

Test Result: Pass

[Test mode: TX n40 High channel]; [Polarity: Vertical]



*:Maximum data x:Over limit !:over margin

⟨Reference Only

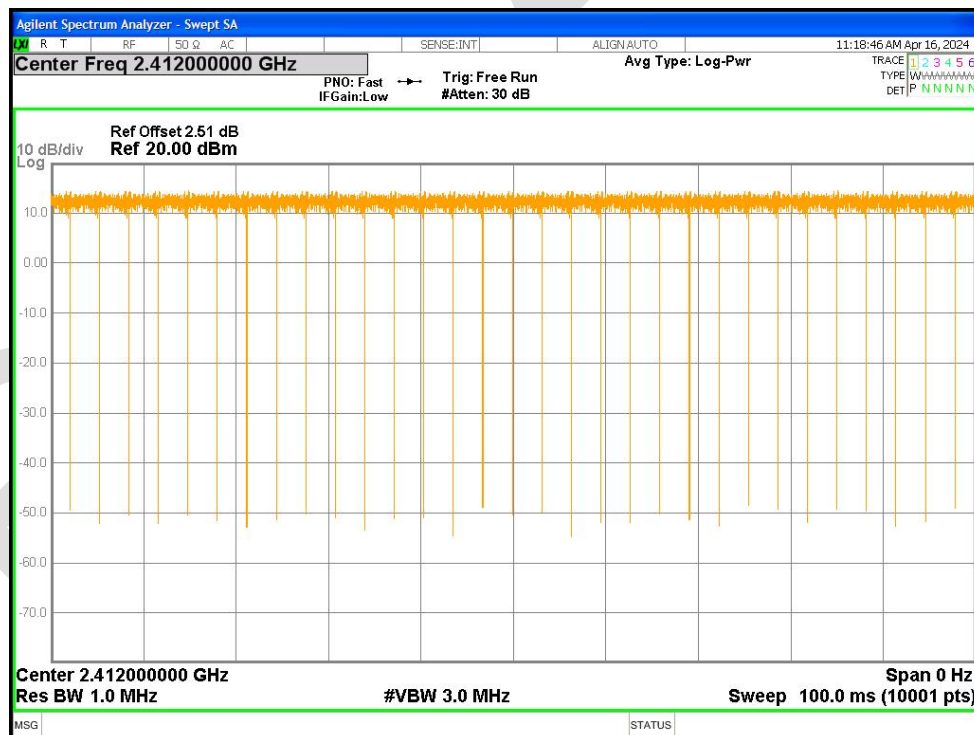
Test Result: Pass

7 Appendix A

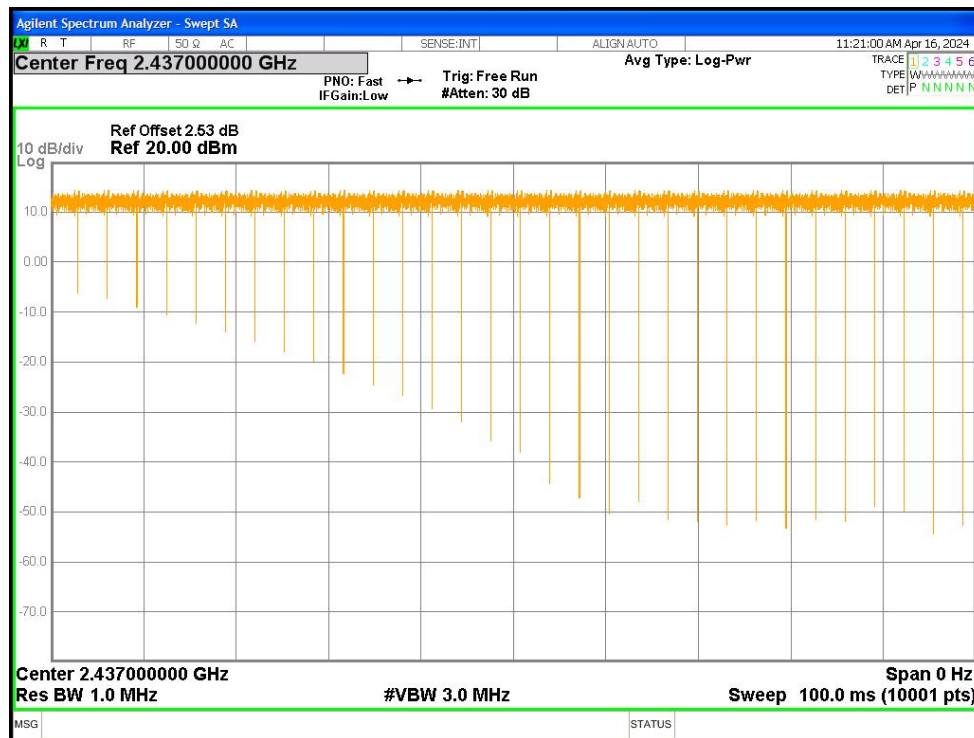
7.1 Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	b	2412	Ant1	99.69	0.01
NVNT	b	2437	Ant1	99.85	0.01
NVNT	b	2462	Ant1	99.69	0.01
NVNT	g	2412	Ant1	97.75	0.1
NVNT	g	2437	Ant1	97.86	0.09
NVNT	g	2462	Ant1	97.72	0.1
NVNT	n20	2412	Ant1	96.66	0.15
NVNT	n20	2437	Ant1	98.24	0.08
NVNT	n20	2462	Ant1	98.25	0.08
NVNT	n40	2422	Ant1	95.32	0.21
NVNT	n40	2437	Ant1	95.17	0.21
NVNT	n40	2452	Ant1	95.42	0.2

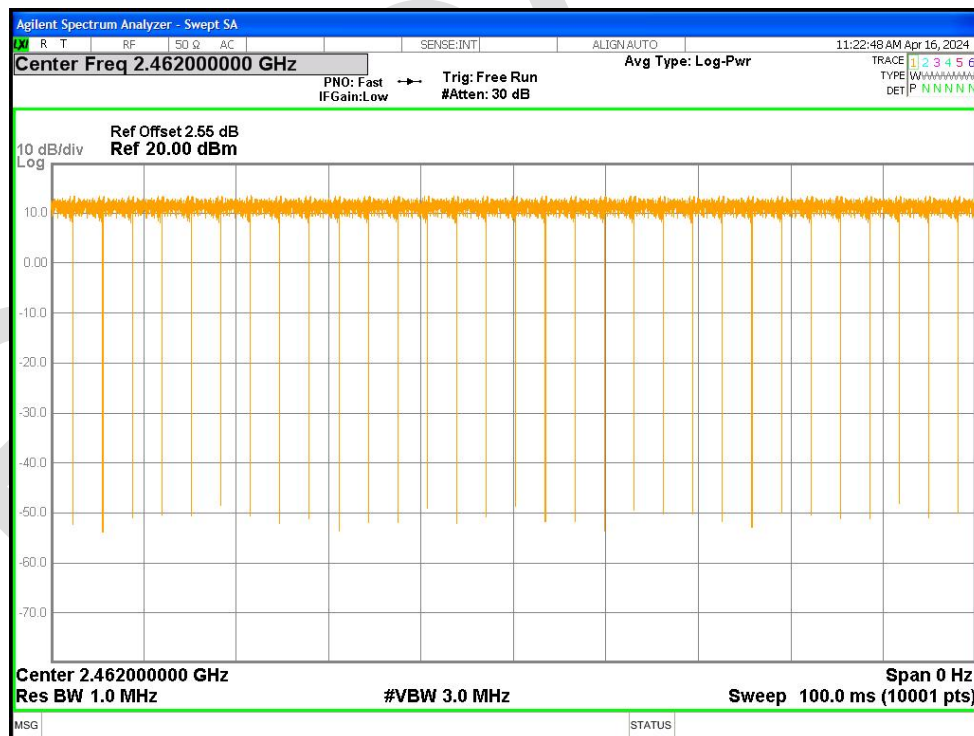
Duty Cycle NVNT b 2412MHz Ant1



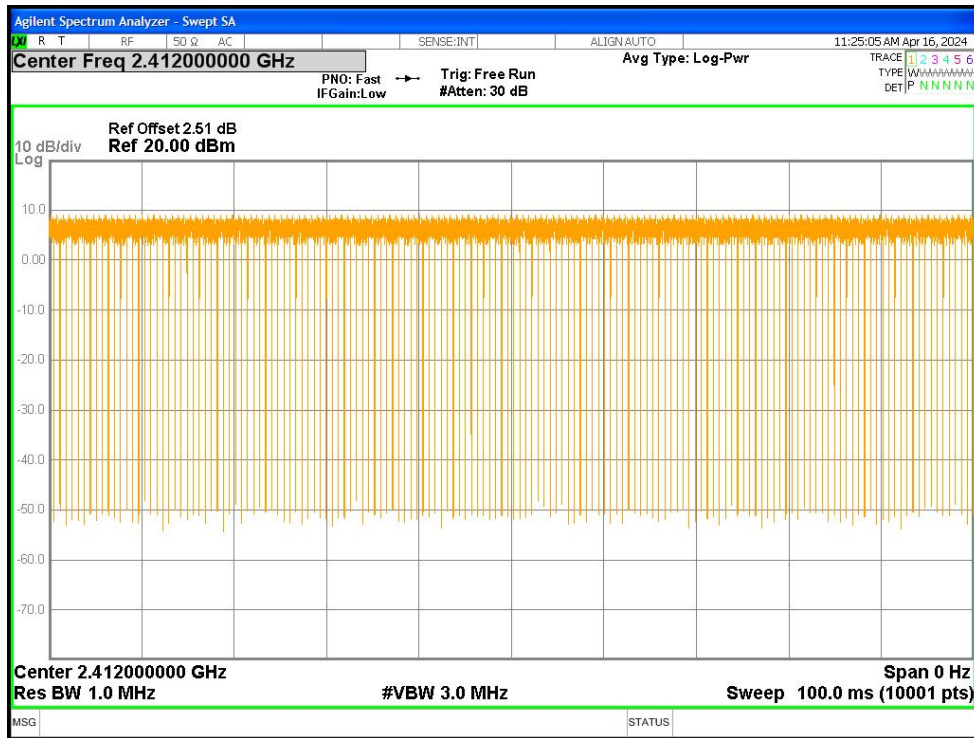
Duty Cycle NVNT b 2437MHz Ant1



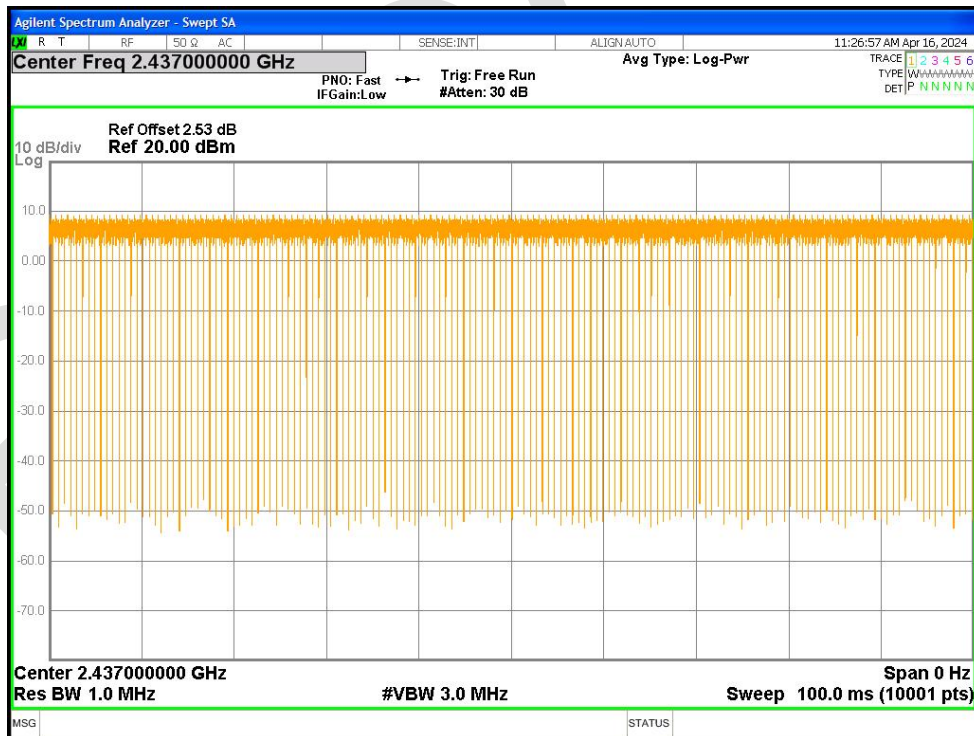
Duty Cycle NVNT b 2462MHz Ant1



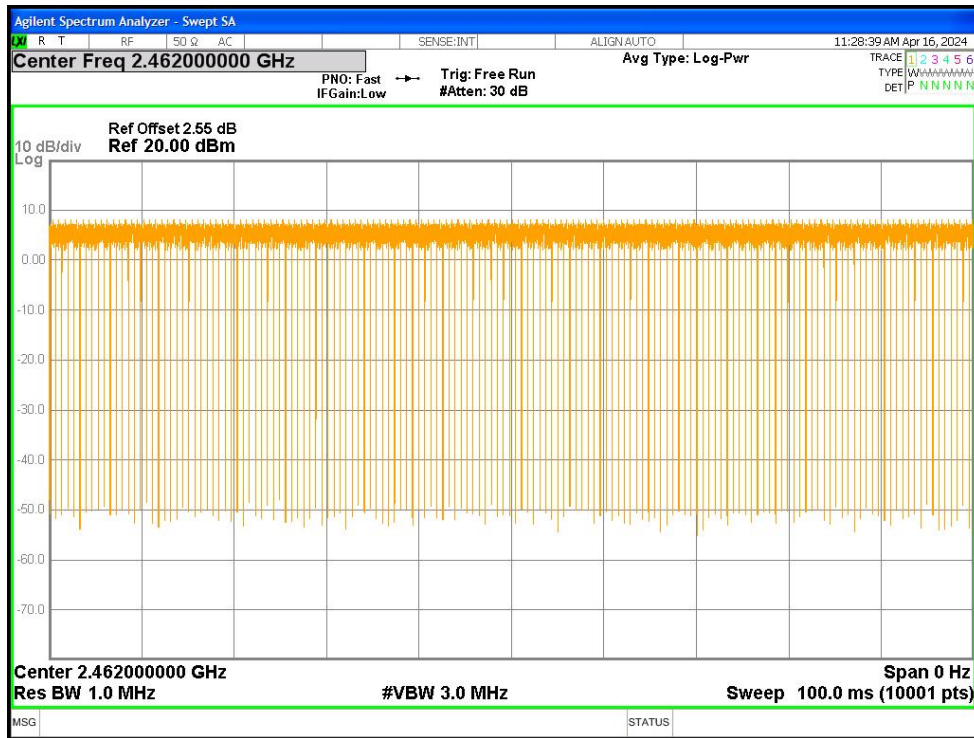
Duty Cycle NVNT g 2412MHz Ant1



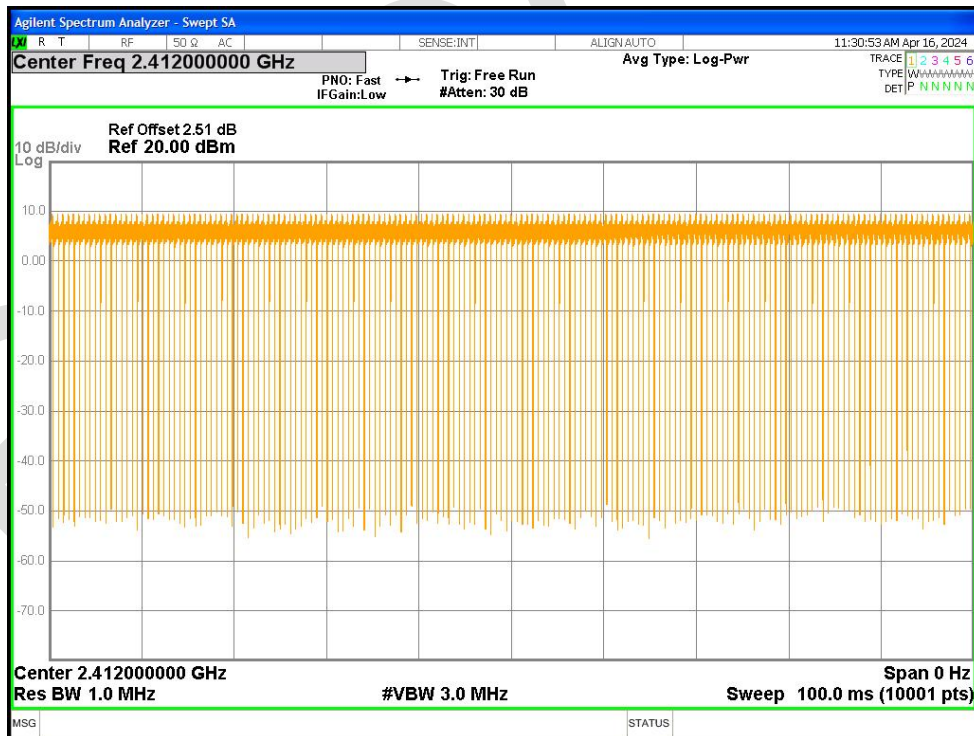
Duty Cycle NVNT g 2437MHz Ant1



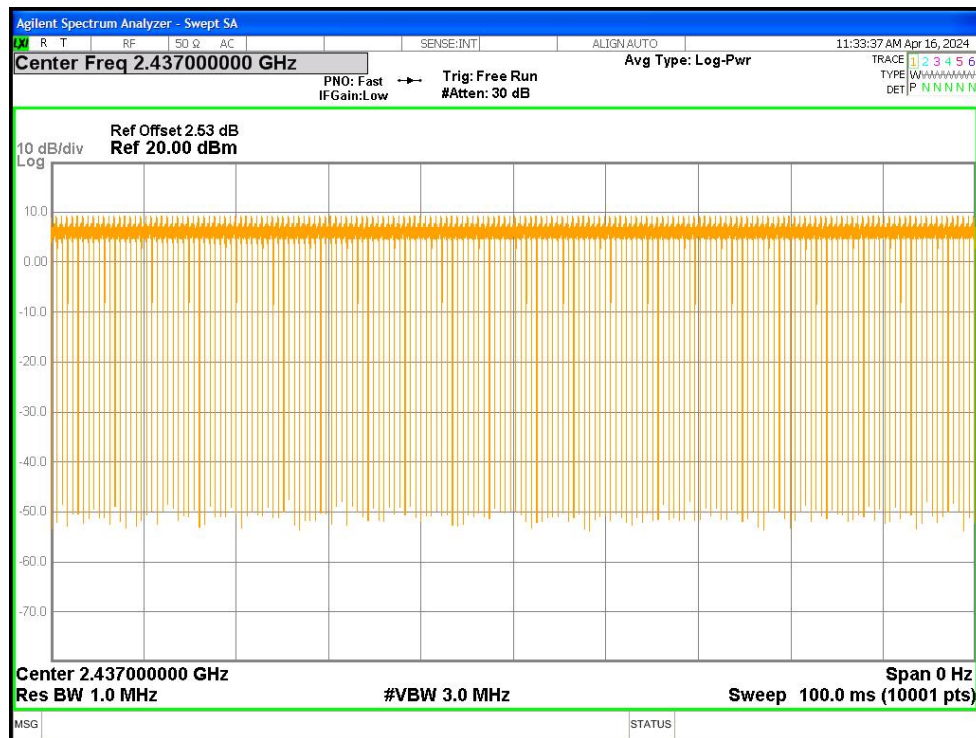
Duty Cycle NVNT g 2462MHz Ant1



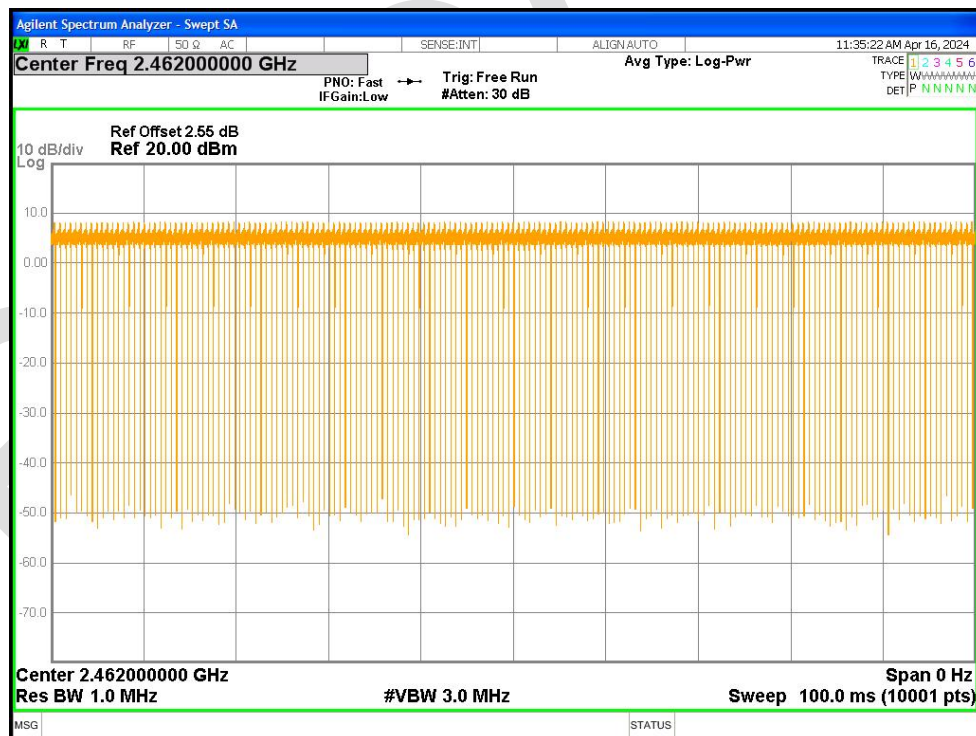
Duty Cycle NVNT n20 2412MHz Ant1



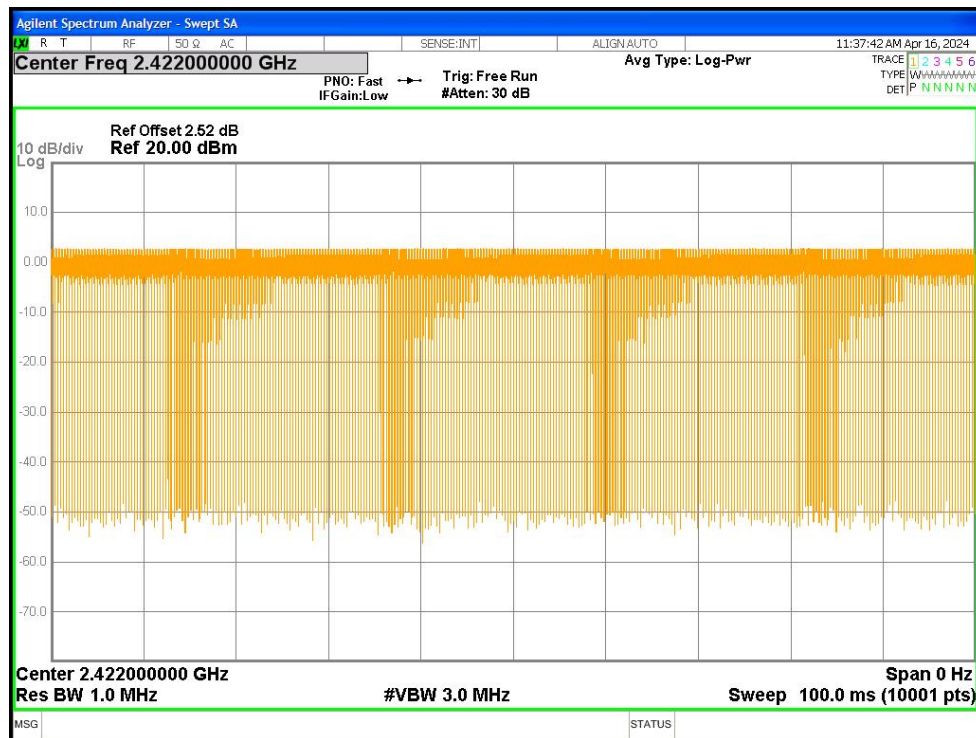
Duty Cycle NVNT n20 2437MHz Ant1



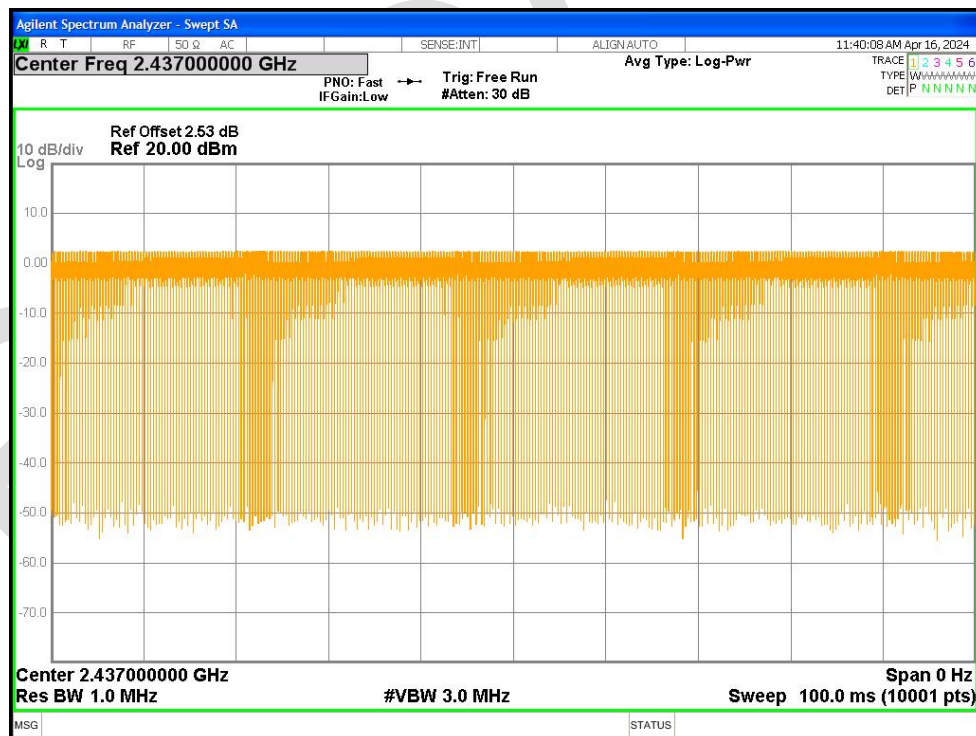
Duty Cycle NVNT n20 2462MHz Ant1



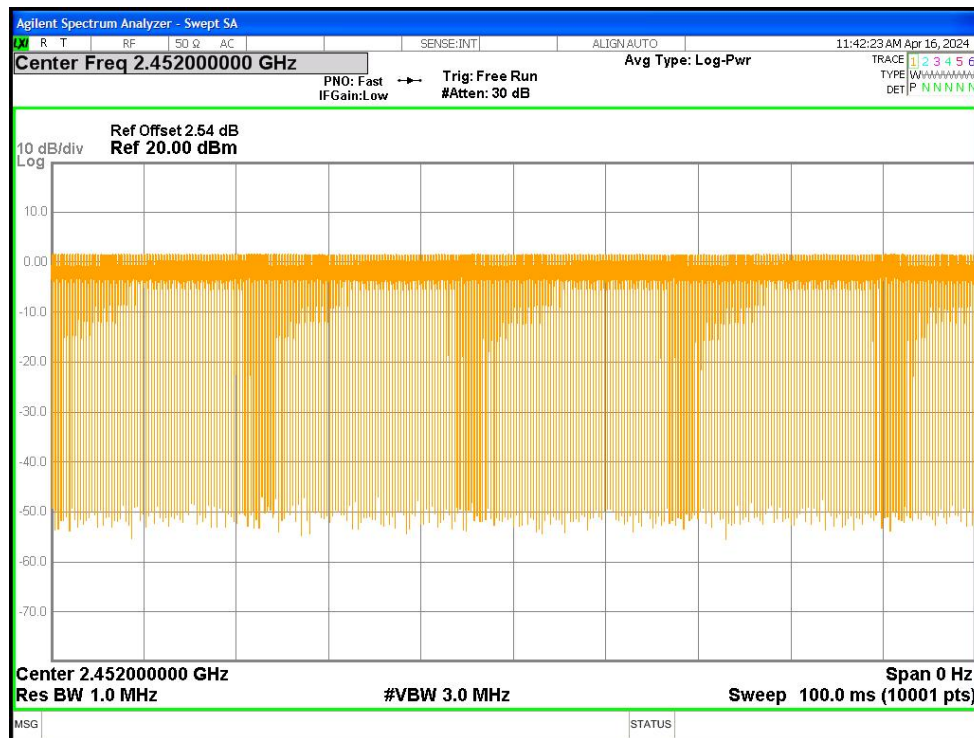
Duty Cycle NVNT n40 2422MHz Ant1



Duty Cycle NVNT n40 2437MHz Ant1



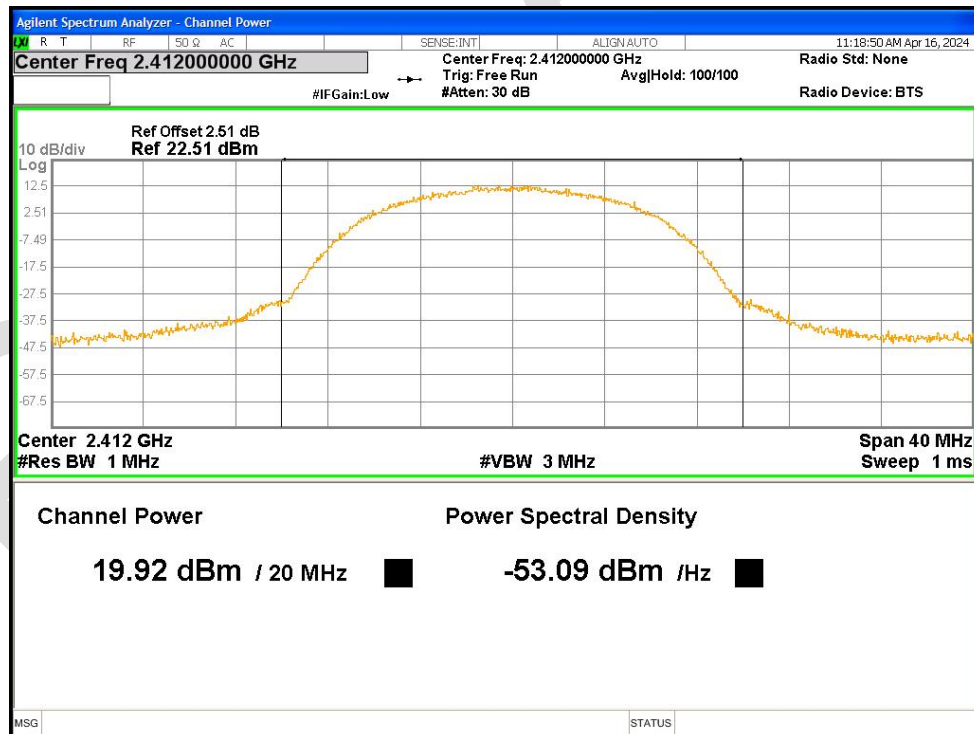
Duty Cycle NVNT n40 2452MHz Ant1



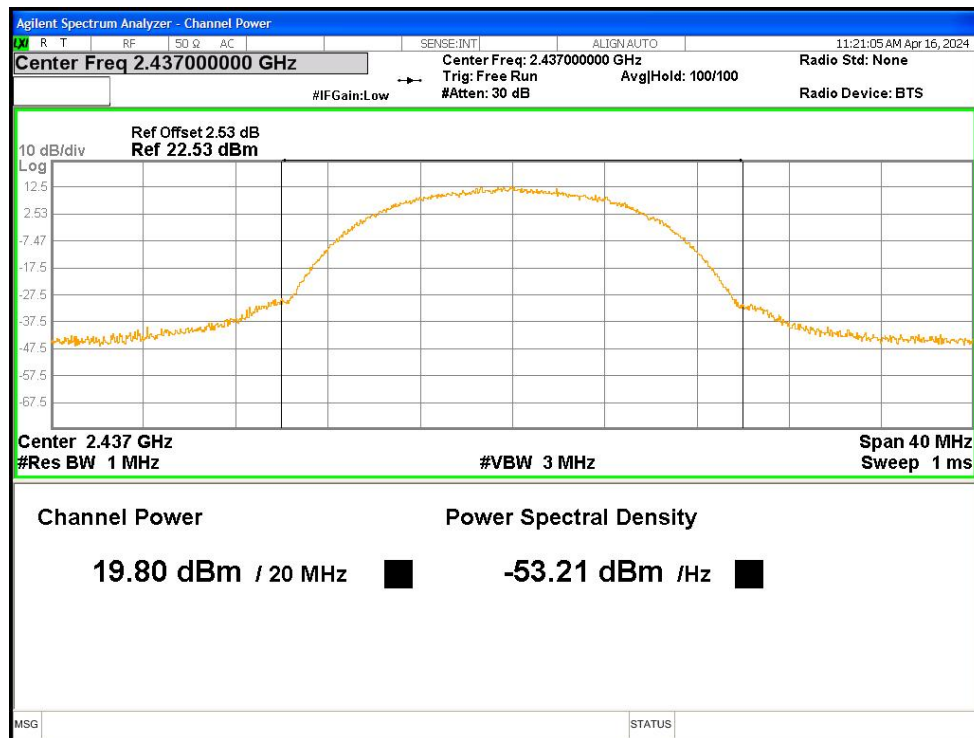
7.2 Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	19.919	0.01	19.929	30	Pass
NVNT	b	2437	Ant1	19.801	0.01	19.811	30	Pass
NVNT	b	2462	Ant1	18.899	0.01	18.909	30	Pass
NVNT	g	2412	Ant1	18.342	0.1	18.442	30	Pass
NVNT	g	2437	Ant1	18.289	0.09	18.379	30	Pass
NVNT	g	2462	Ant1	17.171	0.1	17.271	30	Pass
NVNT	n20	2412	Ant1	17.958	0.15	18.108	30	Pass
NVNT	n20	2437	Ant1	17.604	0.08	17.684	30	Pass
NVNT	n20	2462	Ant1	16.422	0.08	16.502	30	Pass
NVNT	n40	2422	Ant1	17.369	0.21	17.579	30	Pass
NVNT	n40	2437	Ant1	16.886	0.21	17.096	30	Pass
NVNT	n40	2452	Ant1	16.628	0.2	16.828	30	Pass

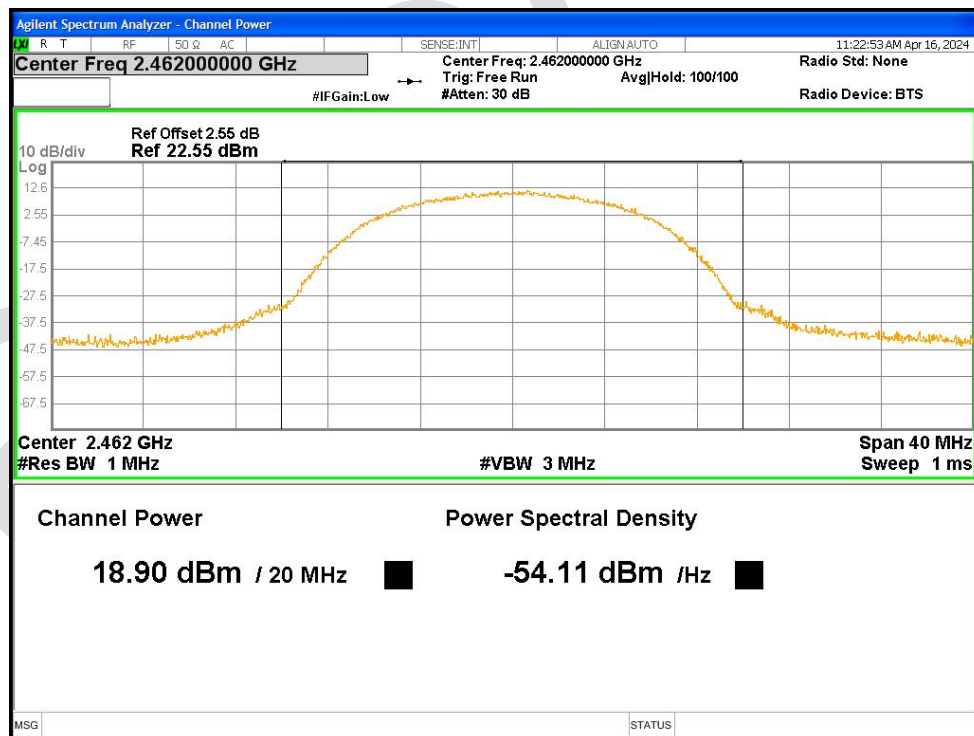
Power NVNT b 2412MHz Ant1



Power NVNT b 2437MHz Ant1



Power NVNT b 2462MHz Ant1



Power NVNT g 2412MHz Ant1