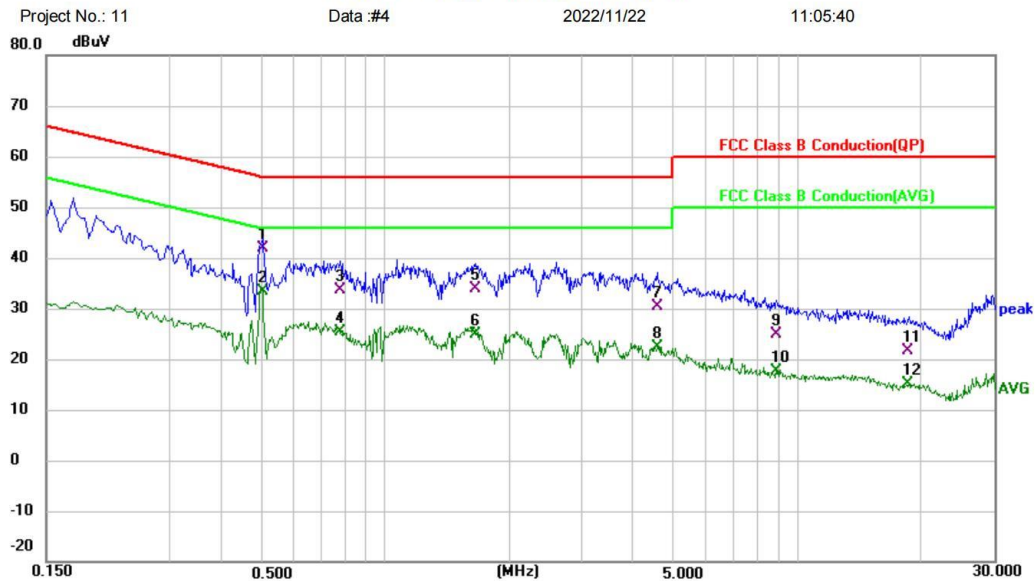


[TestMode: BT mode]; [Line: Line] ;[Power:AC120V/60Hz]

Conducted Emission Measurement



Site: Phase: **L1** Temperature: (C)
Limit: FCC Class B Conduction(QP) Power: Humidity: %RH
EUT: WIFI Module
M/N: RW8822-50B1
Mode: BT mode
Note:

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.5020	31.84	10.08	41.92	56.00	-14.08	QP	
2 *	0.5020	23.33	10.08	33.41	46.00	-12.59	AVG	
3	0.7780	23.43	10.09	33.52	56.00	-22.48	QP	
4	0.7780	15.39	10.09	25.48	46.00	-20.52	AVG	
5	1.6580	23.57	10.24	33.81	56.00	-22.19	QP	
6	1.6580	14.55	10.24	24.79	46.00	-21.21	AVG	
7	4.5700	20.38	10.05	30.43	56.00	-25.57	QP	
8	4.5700	12.25	10.05	22.30	46.00	-23.70	AVG	
9	8.9140	14.72	10.11	24.83	60.00	-35.17	QP	
10	8.9140	7.45	10.11	17.56	50.00	-32.44	AVG	
11	18.7099	11.59	10.00	21.59	60.00	-38.41	QP	
12	18.7099	5.09	10.00	15.09	50.00	-34.91	AVG	

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

(Reference Only)

Test Result: Pass

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

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19 RADIATED SPURIOUS EMISSIONS

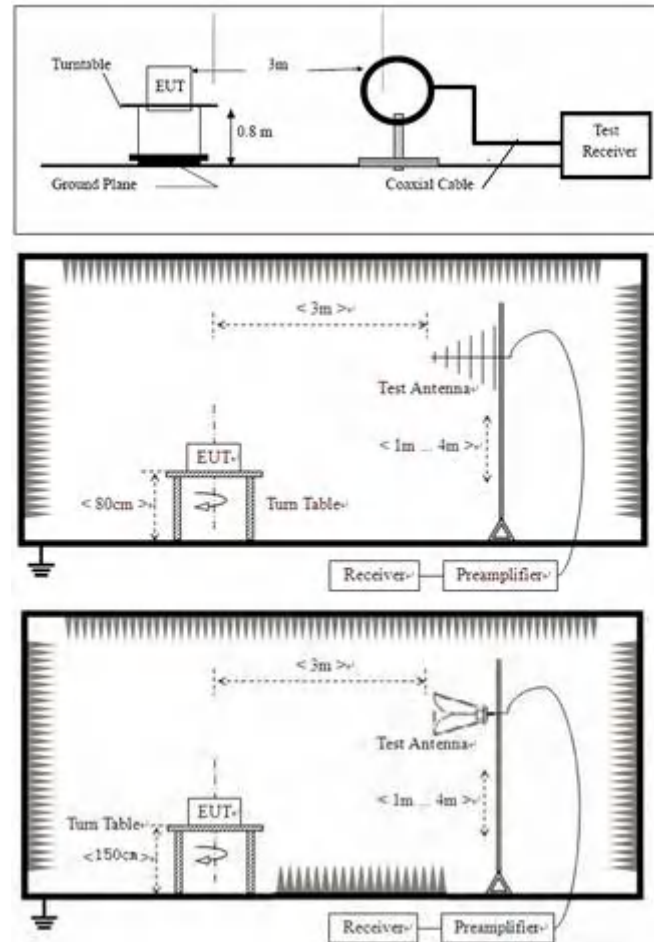
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.4,6.5,6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

19.1 LIMITS

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.

19.2 BLOCK DIAGRAM OF TEST SETUP



19.3 PROCEDURE

- 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.
- 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.
- 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.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.

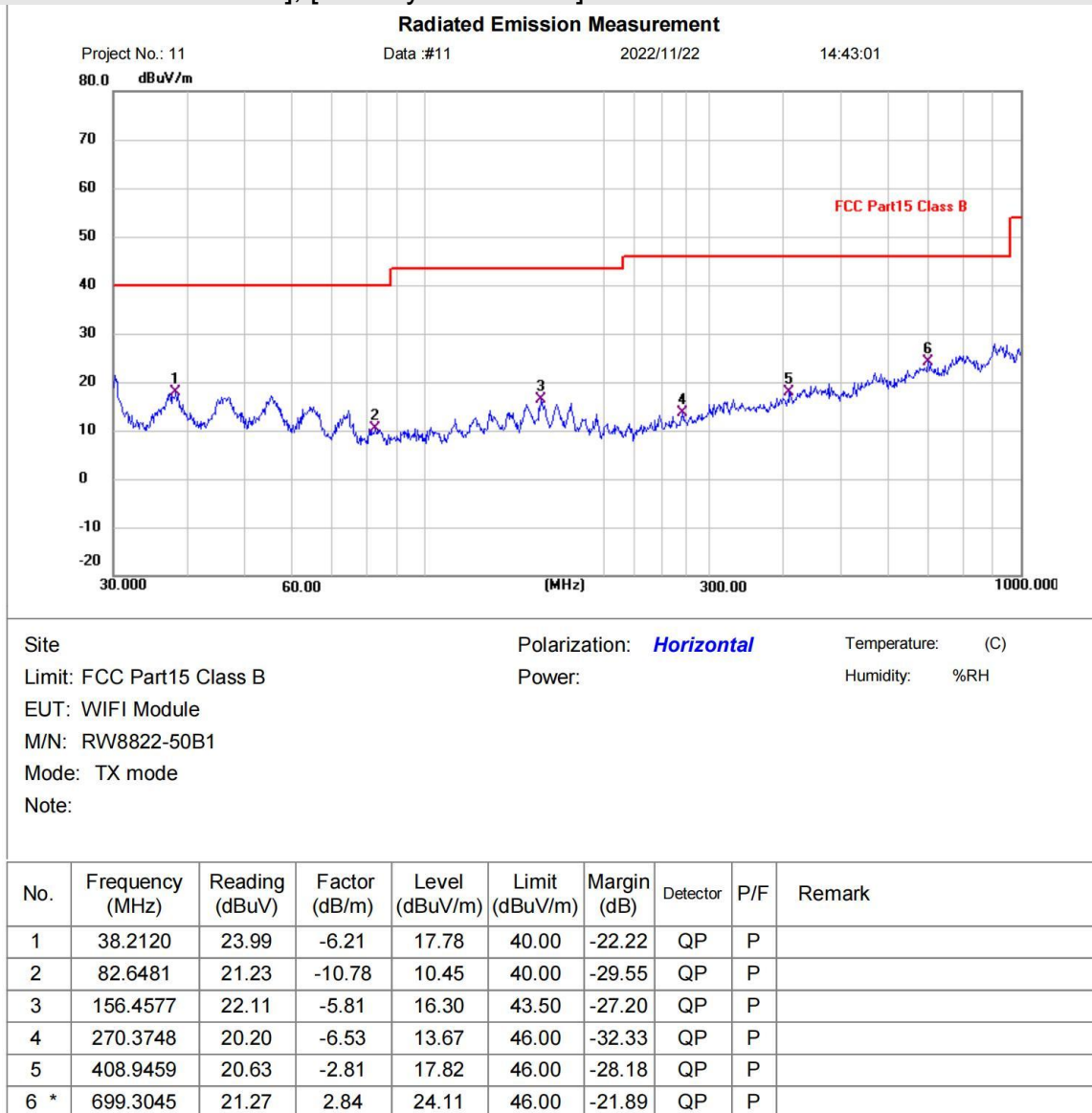
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) 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.

19.4 TEST DATA

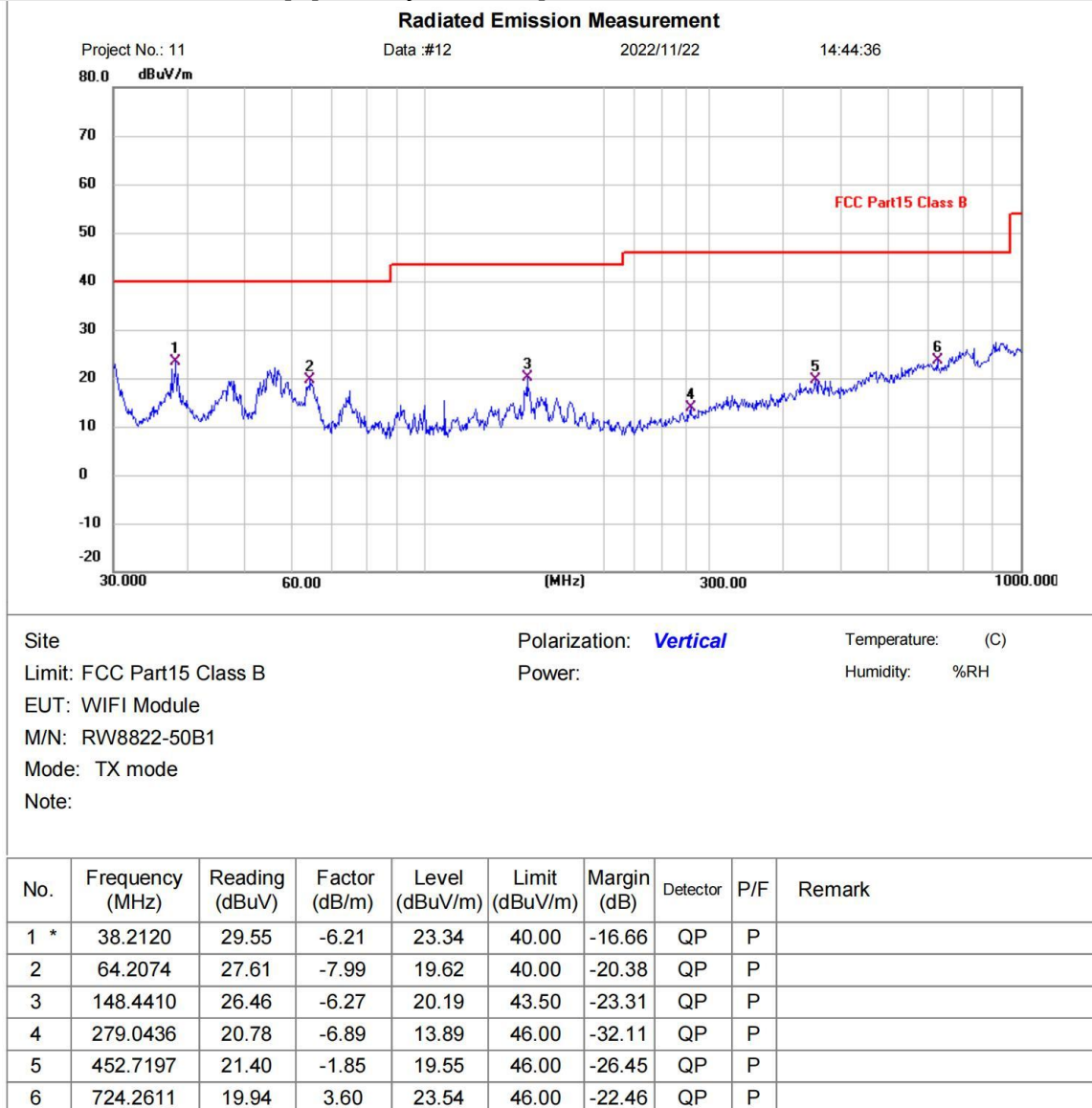
[TestMode: TX below 1G]; [Polarity: Horizontal]



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

Test Result: Pass

[TestMode: TX below 1G]; [Polarity: Vertical]

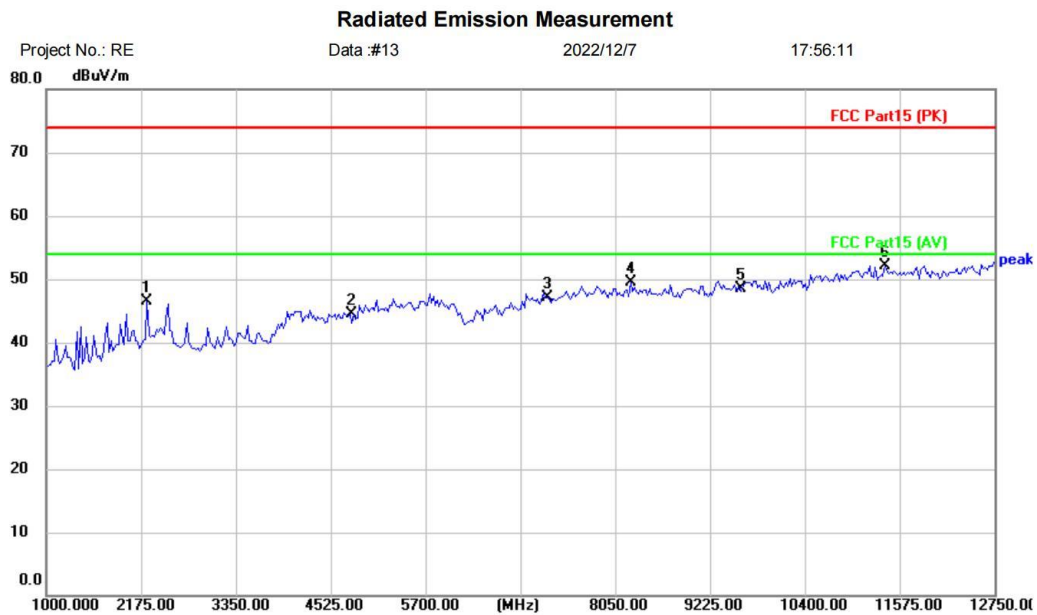


*:Maximum data x:Over limit !:over margin

Test Result: Pass

Above 1GHz:

[TestMode: TX low channel]; [Polarity: Vertical]



Site: Polarization: **Vertical** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: WIFI&BT Module
M/N: RW8822-50B1
Mode: TX-L
Note:

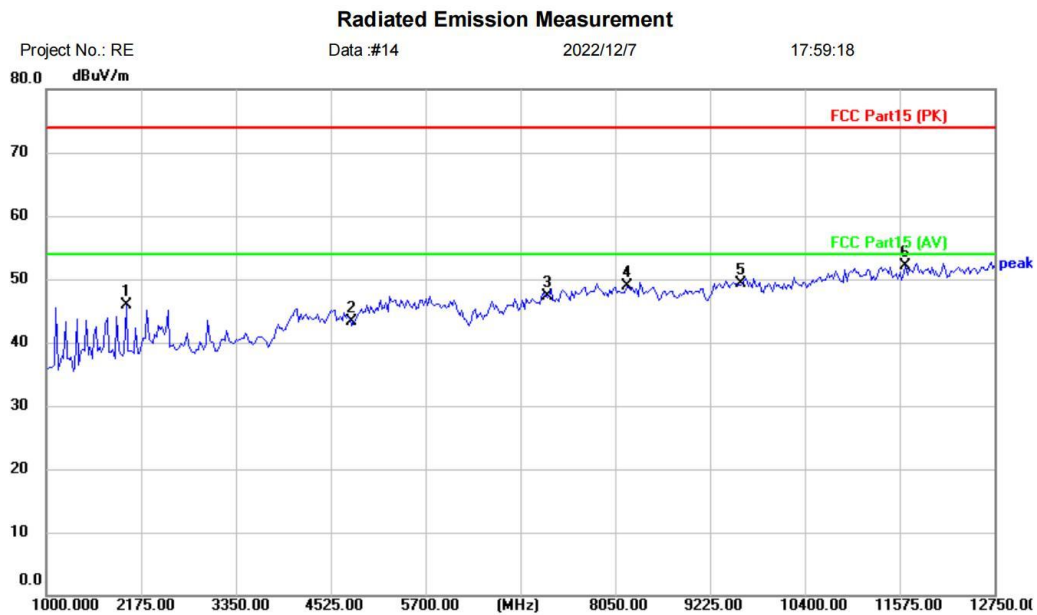
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2245.500	49.83	-3.35	46.48	74.00	-27.52	peak	
2		4804.000	40.37	4.05	44.42	74.00	-29.58	peak	
3		7206.000	39.17	7.93	47.10	74.00	-26.90	peak	
4		8238.000	40.44	9.00	49.44	74.00	-24.56	peak	
5		9608.000	37.53	10.90	48.43	74.00	-25.57	peak	
6	*	11387.000	38.56	13.63	52.19	74.00	-21.81	peak	

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

(Reference Only)

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Horizontal]



Site: Polarization: **Horizontal** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: WIFI&BT Module
M/N: RW8822-50B1
Mode: TX-L
Note:

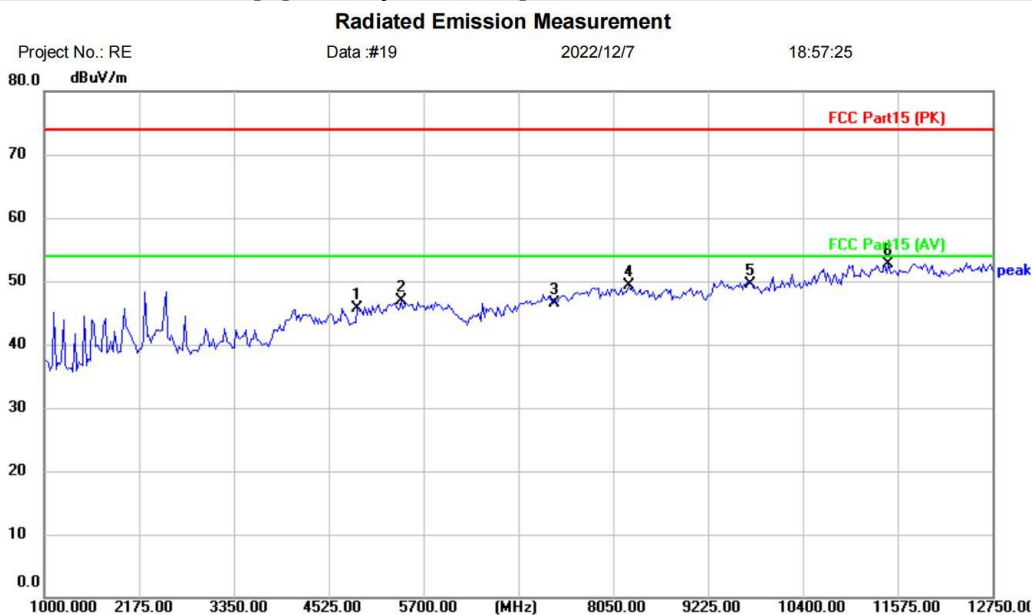
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		1987.000	50.44	-4.50	45.94	74.00	-28.06	peak	
2		4804.000	39.21	4.05	43.26	74.00	-30.74	peak	
3		7206.000	39.39	7.93	47.32	74.00	-26.68	peak	
4		8191.000	39.93	8.99	48.92	74.00	-25.08	peak	
5		9608.000	38.31	10.90	49.21	74.00	-24.79	peak	
6	*	11645.500	38.38	13.74	52.12	74.00	-21.88	peak	

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

(Reference Only)

Test Result: Pass

[TestMode: TX mid channel]; [Polarity: Vertical]



Site: Polarization: **Vertical** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: WIFI&BT Module
M/N: RW8822-50B1
Mode: TX-M
Note:

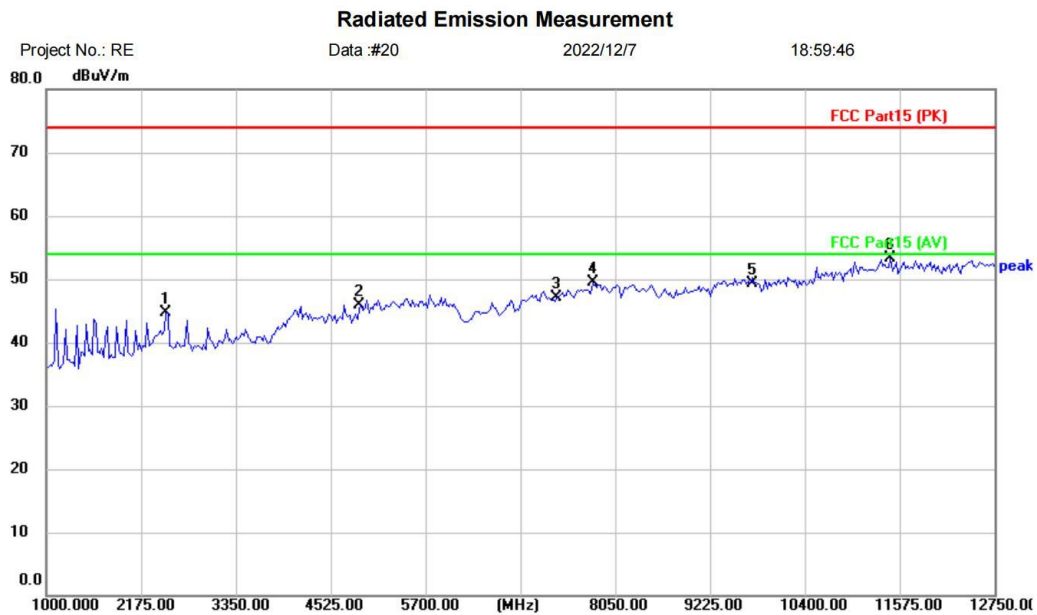
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1		4882.000	41.34	4.37	45.71	74.00	-28.29	peak	
2		5418.000	40.13	6.75	46.88	74.00	-27.12	peak	
3		7323.000	38.32	8.21	46.53	74.00	-27.47	peak	
4		8238.000	40.28	9.00	49.28	74.00	-24.72	peak	
5		9764.000	38.29	11.30	49.59	74.00	-24.41	peak	
6	*	11457.500	39.01	13.66	52.67	74.00	-21.33	peak	

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

(Reference Only)

Test Result: Pass

[TestMode: TX mid channel]; [Polarity: Horizontal]



Site: Polarization: **Horizontal** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: WIFI&BT Module
M/N: RW8822-50B1
Mode: TX-M
Note:

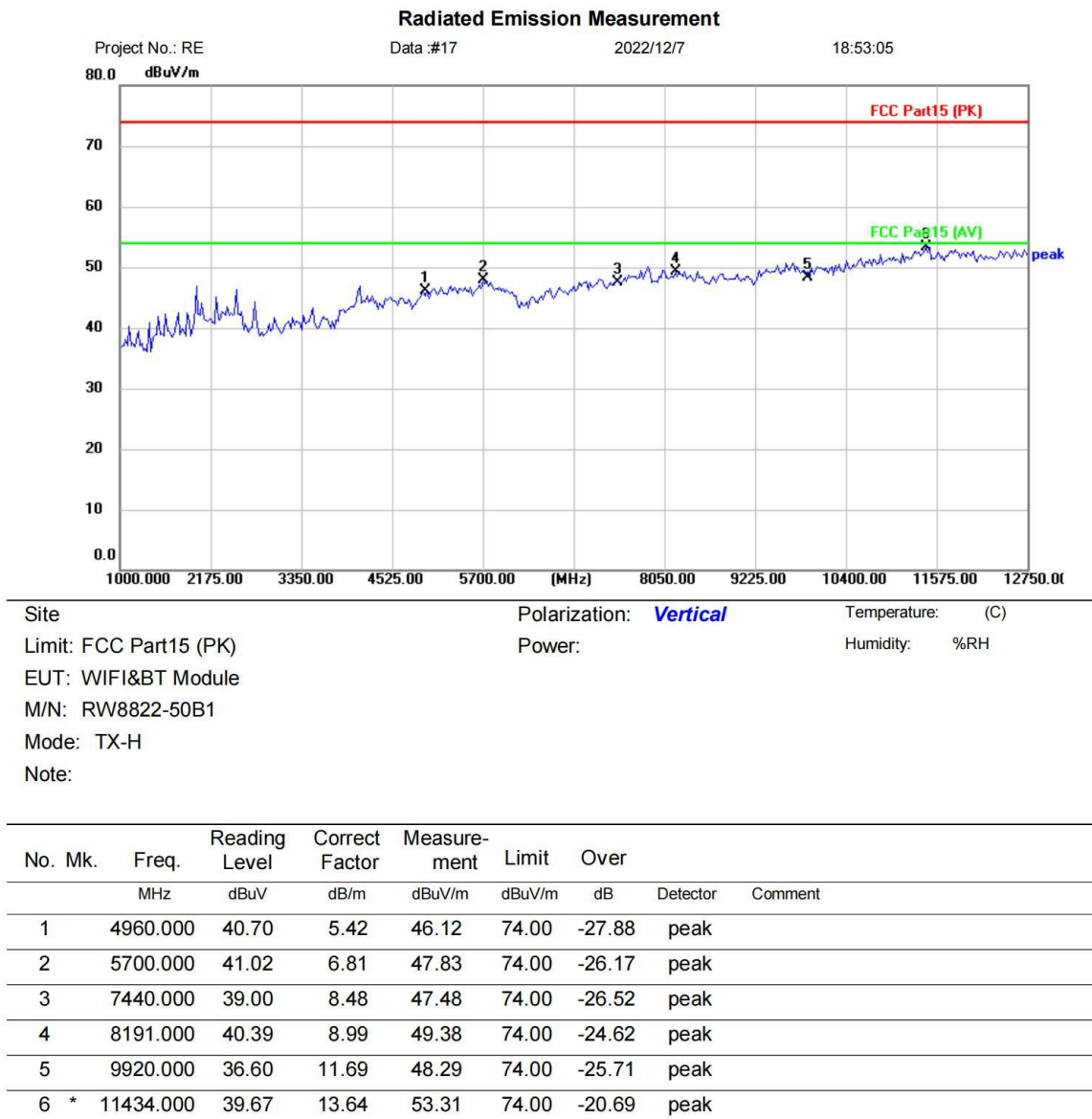
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		2480.500	46.73	-2.05	44.68	74.00	-29.32	peak	
2		4882.000	41.48	4.37	45.85	74.00	-28.15	peak	
3		7323.000	38.97	8.21	47.18	74.00	-26.82	peak	
4		7768.000	40.75	8.77	49.52	74.00	-24.48	peak	
5		9764.000	37.93	11.30	49.23	74.00	-24.77	peak	
6	*	11457.500	39.60	13.66	53.26	74.00	-20.74	peak	

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

(Reference Only)

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Vertical]

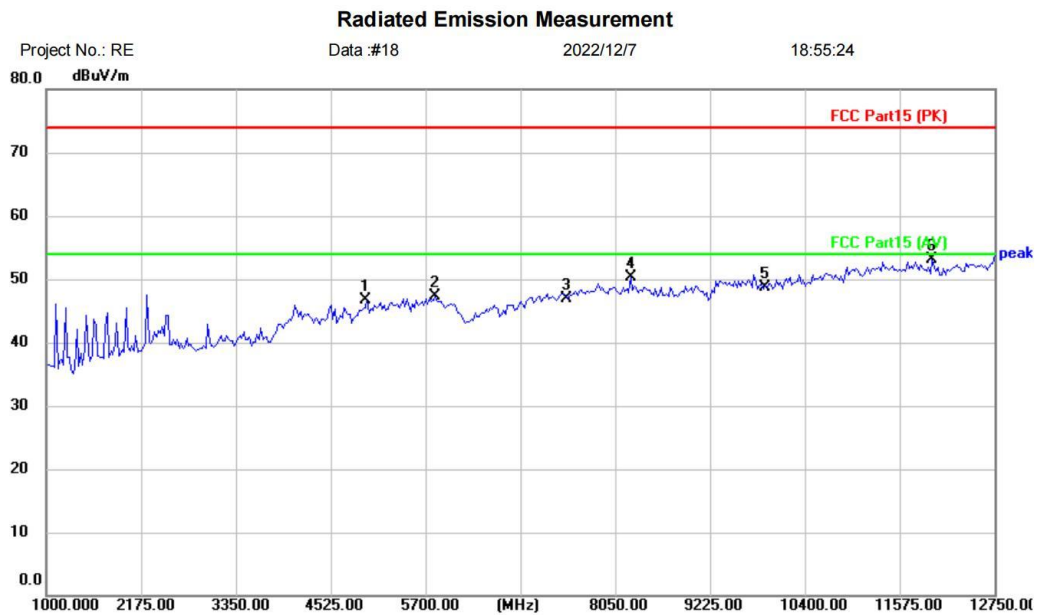


*:Maximum data x:Over limit !:over margin

(Reference Only)

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Horizontal]



Site: Polarization: **Horizontal** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: WIFI&BT Module
M/N: RW8822-50B1
Mode: TX-H
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	41.36	5.42	46.78	74.00	-27.22	peak	
2		5817.500	40.59	6.78	47.37	74.00	-26.63	peak	
3		7440.000	38.50	8.48	46.98	74.00	-27.02	peak	
4		8238.000	41.26	9.00	50.26	74.00	-23.74	peak	
5		9920.000	36.96	11.69	48.65	74.00	-25.35	peak	
6	*	11974.500	39.15	13.89	53.04	74.00	-20.96	peak	

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

(Reference Only)

Test Result: Pass

Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

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20 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

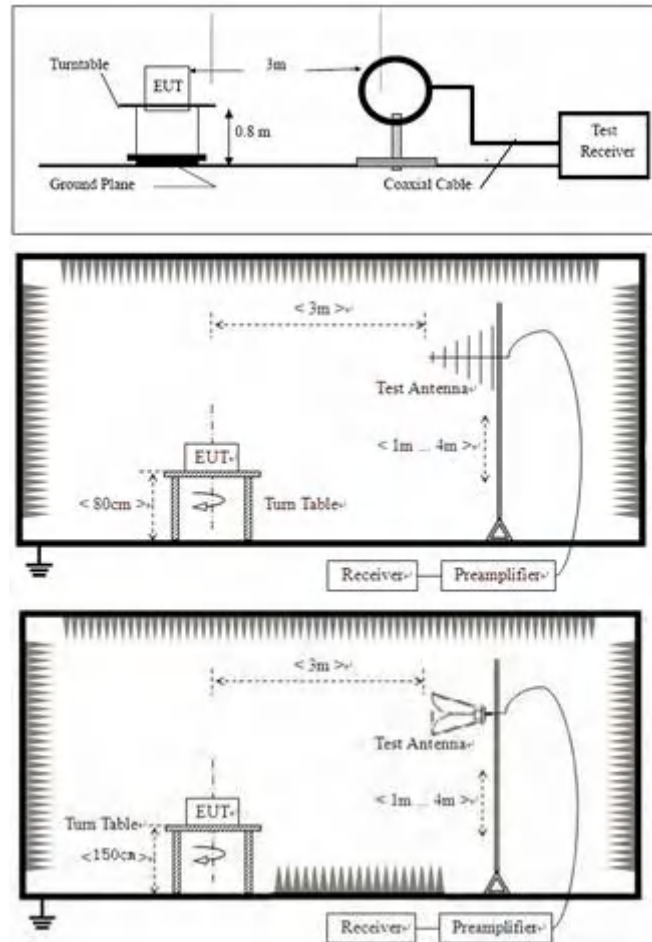
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.10.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

20.1 LIMITS

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.

20.2 BLOCK DIAGRAM OF TEST SETUP



20.3 PROCEDURE

- 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.
- 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.
- 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.
- 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.
- 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.

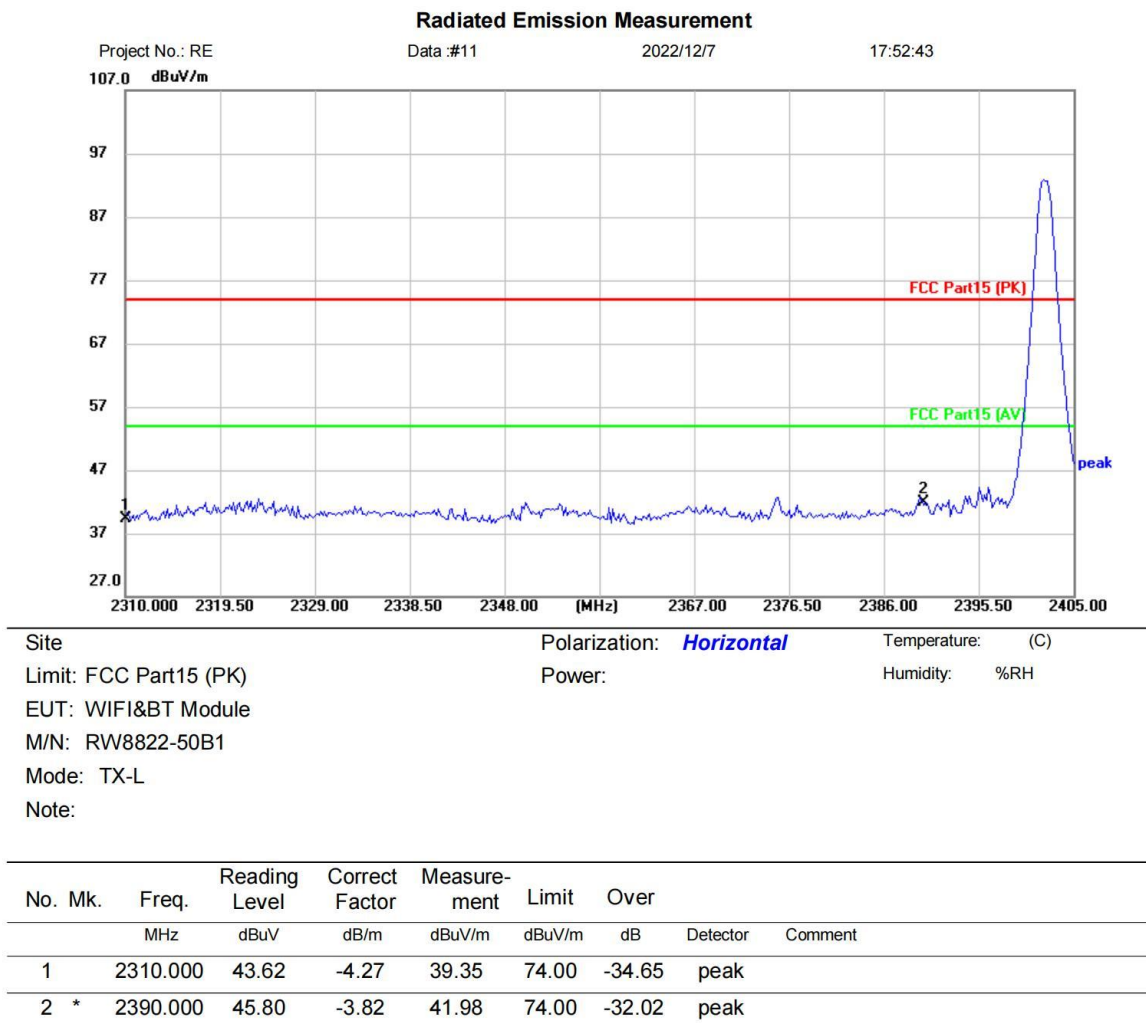
Remark 1: $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

Remark 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.

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20.4 TEST DATA

[TestMode: TX low channel]; [Polarity: Horizontal]

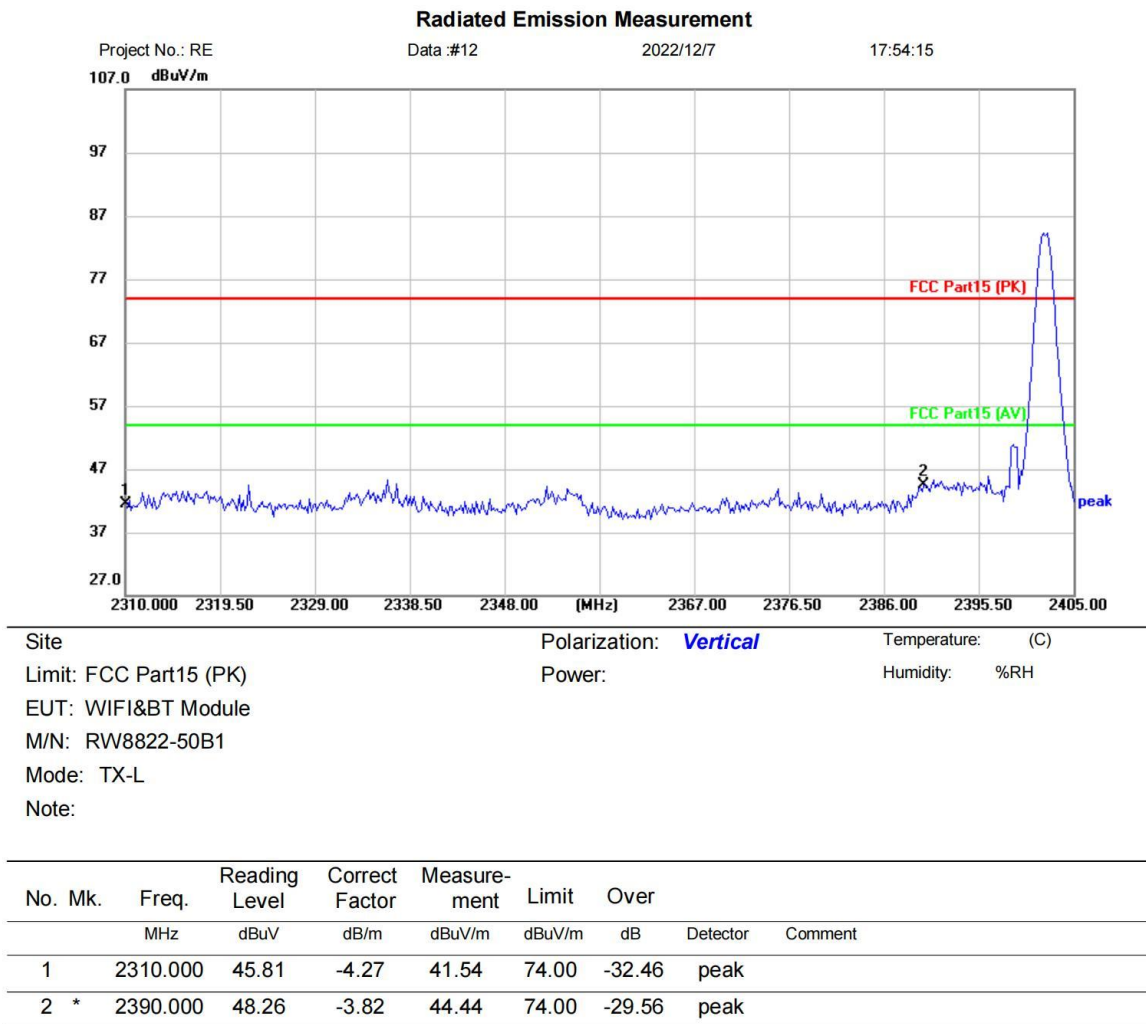


*:Maximum data x:Over limit !:over margin

⟨Reference Only

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Vertical]

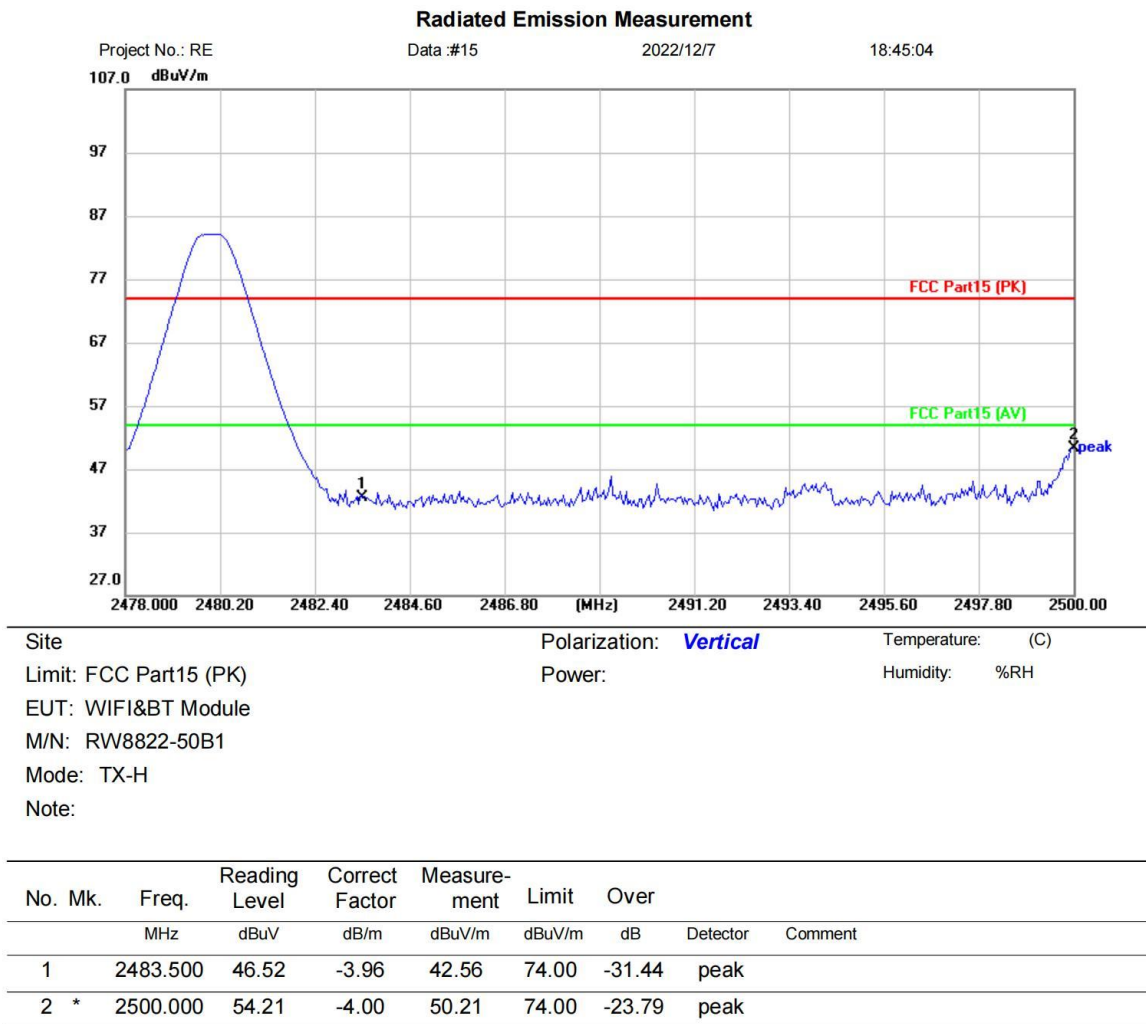


*:Maximum data x:Over limit !:over margin

⟨Reference Only

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Vertical]

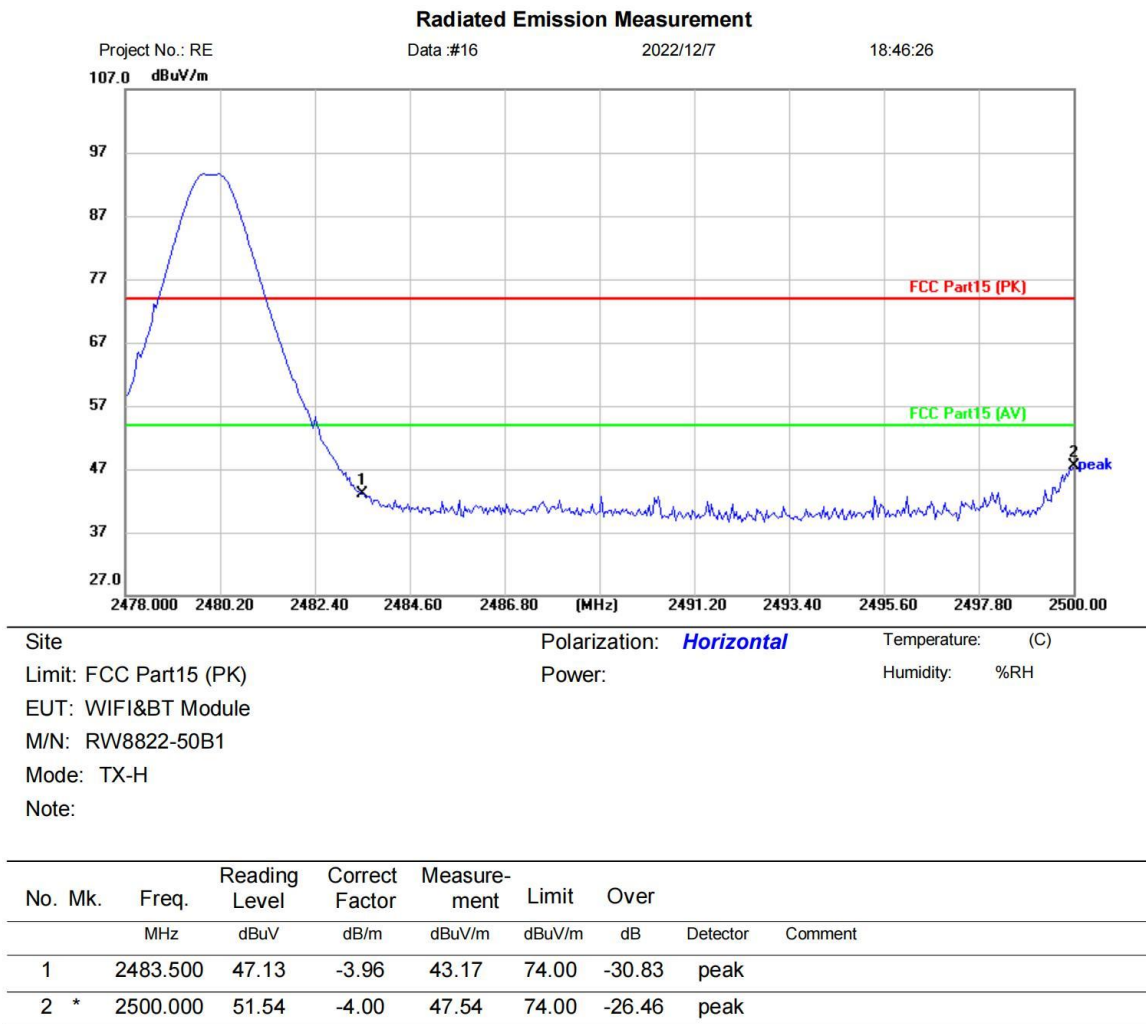


*:Maximum data x:Over limit !:over margin

⟨Reference Only

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Horizontal]



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

(Reference Only)

Test Result: Pass

Remark:

1. Final Level = Receiver Read level + Correct factor
2. Correct factor = Antenna Factor + Cable Loss – Preamplifier Factor
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

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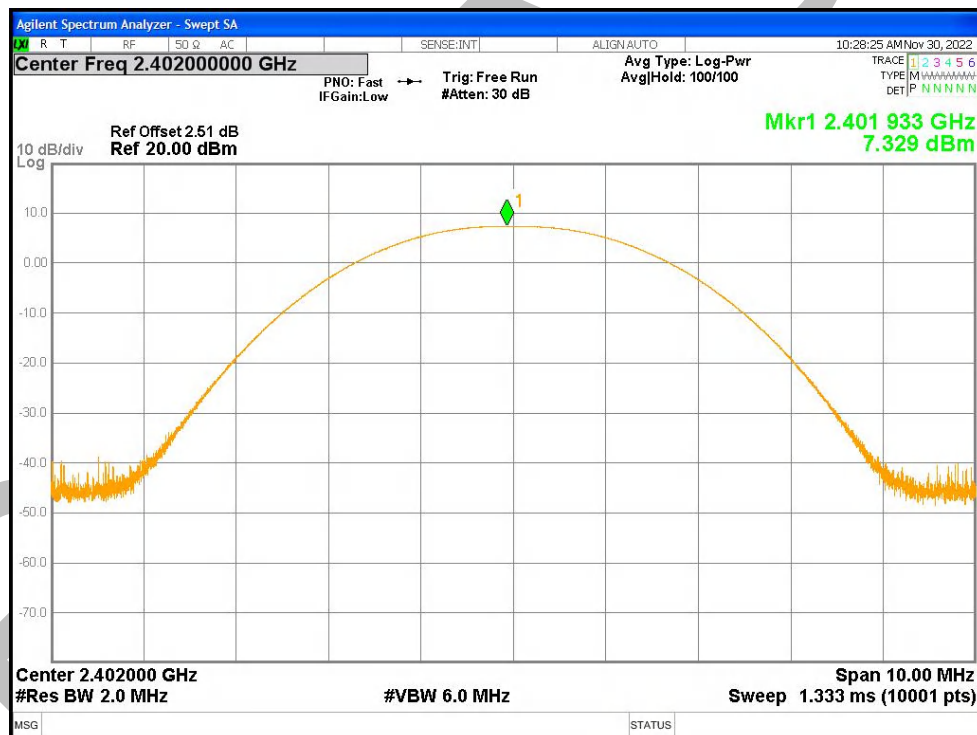
21 APPENDIX

Appendix1

Maximum Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	Ant1	7.329	21	Pass
NVNT	1-DH1	2441	Ant1	7.518	21	Pass
NVNT	1-DH1	2480	Ant1	9.039	21	Pass
NVNT	2-DH1	2402	Ant1	7.586	21	Pass
NVNT	2-DH1	2441	Ant1	7.774	21	Pass
NVNT	2-DH1	2480	Ant1	9.316	21	Pass
NVNT	3-DH1	2402	Ant1	5.927	21	Pass
NVNT	3-DH1	2441	Ant1	6.131	21	Pass
NVNT	3-DH1	2480	Ant1	7.657	21	Pass

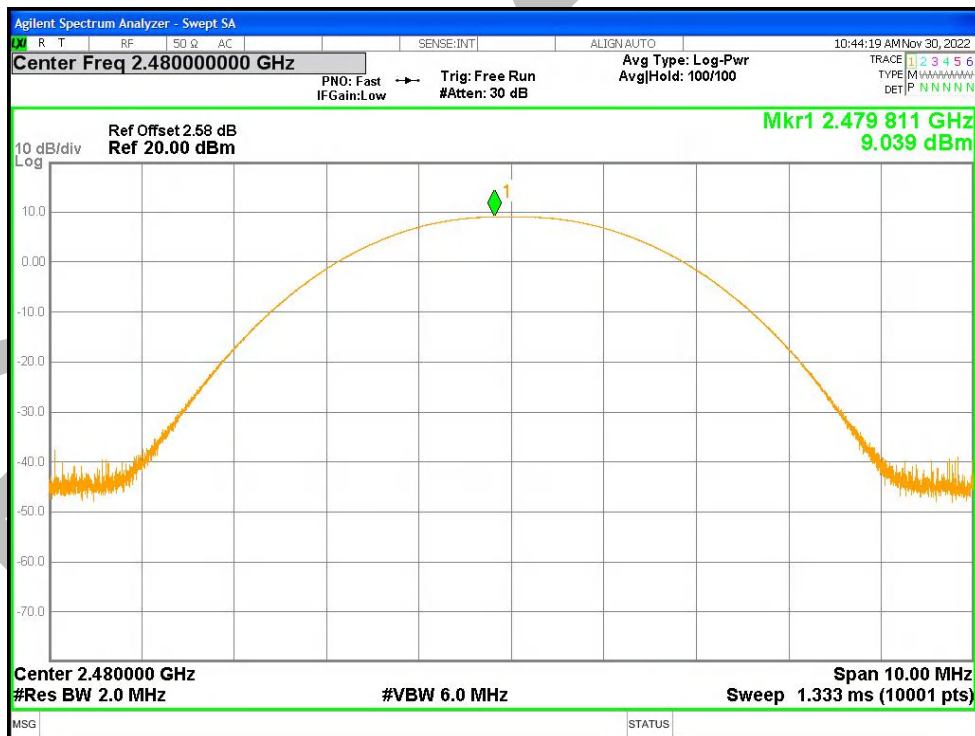
Power NVNT 1-DH1 2402MHz Ant1



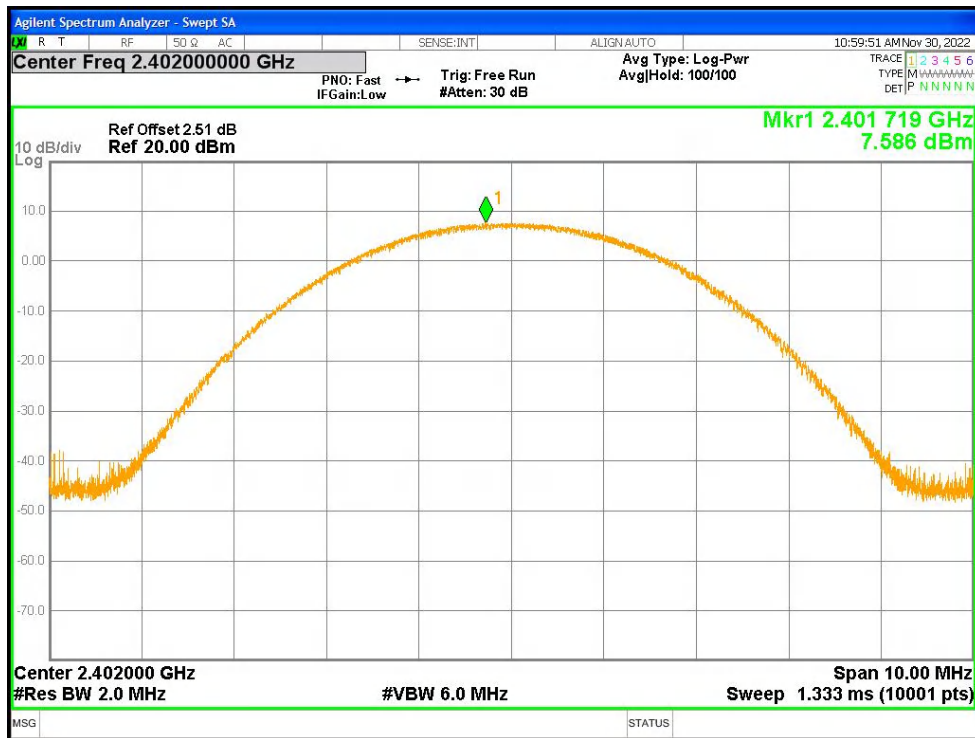
Power NVNT 1-DH1 2441MHz Ant1



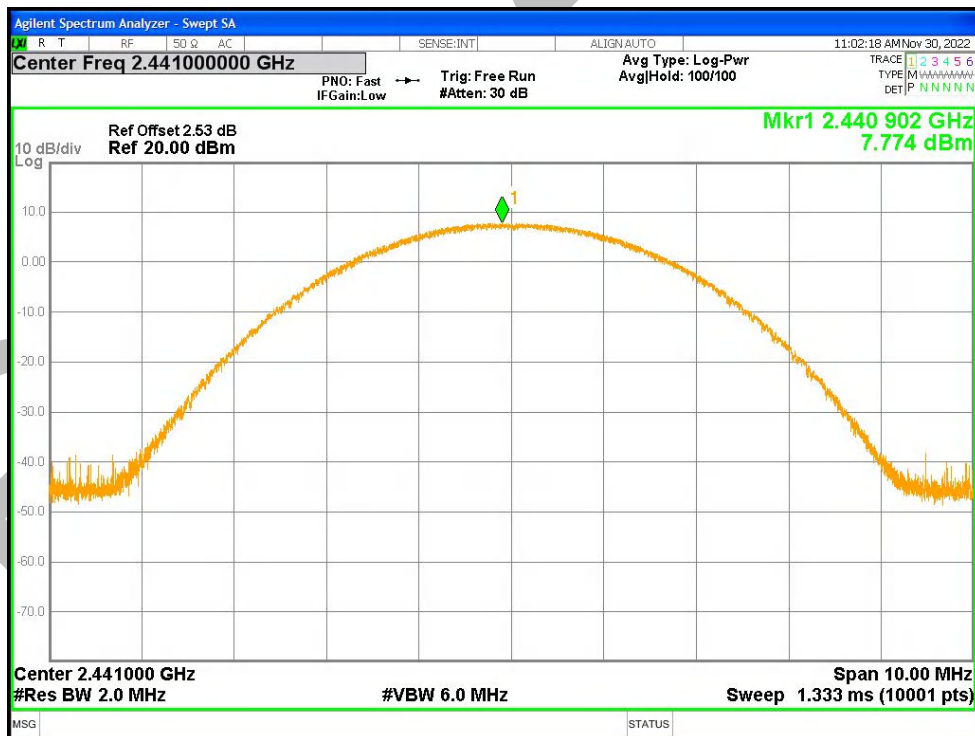
Power NVNT 1-DH1 2480MHz Ant1



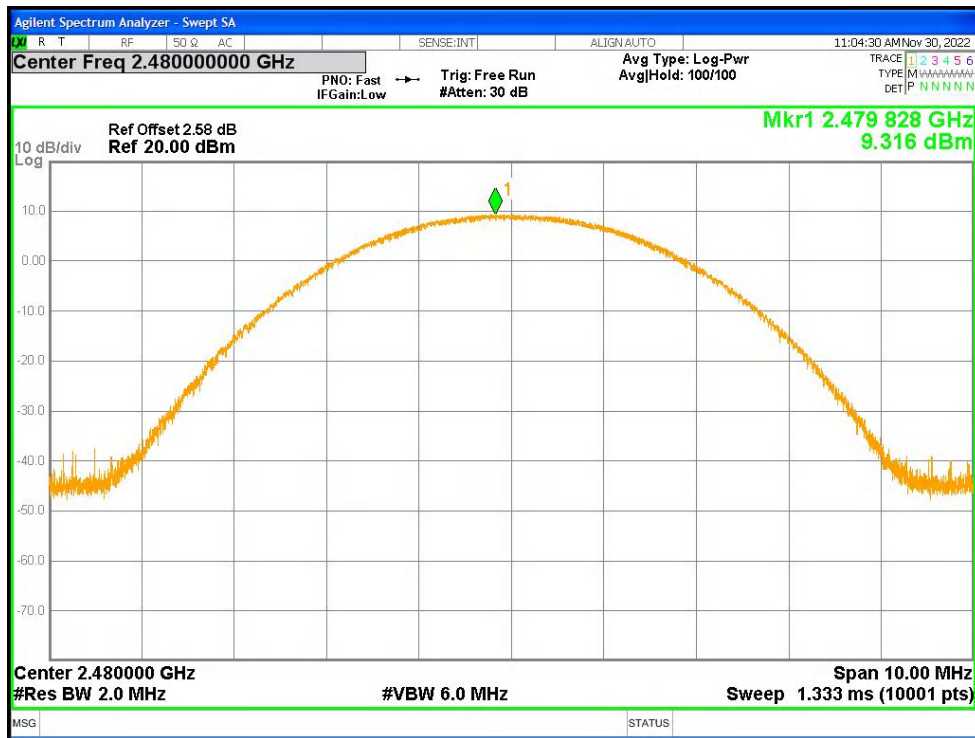
Power NVNT 2-DH1 2402MHz Ant1



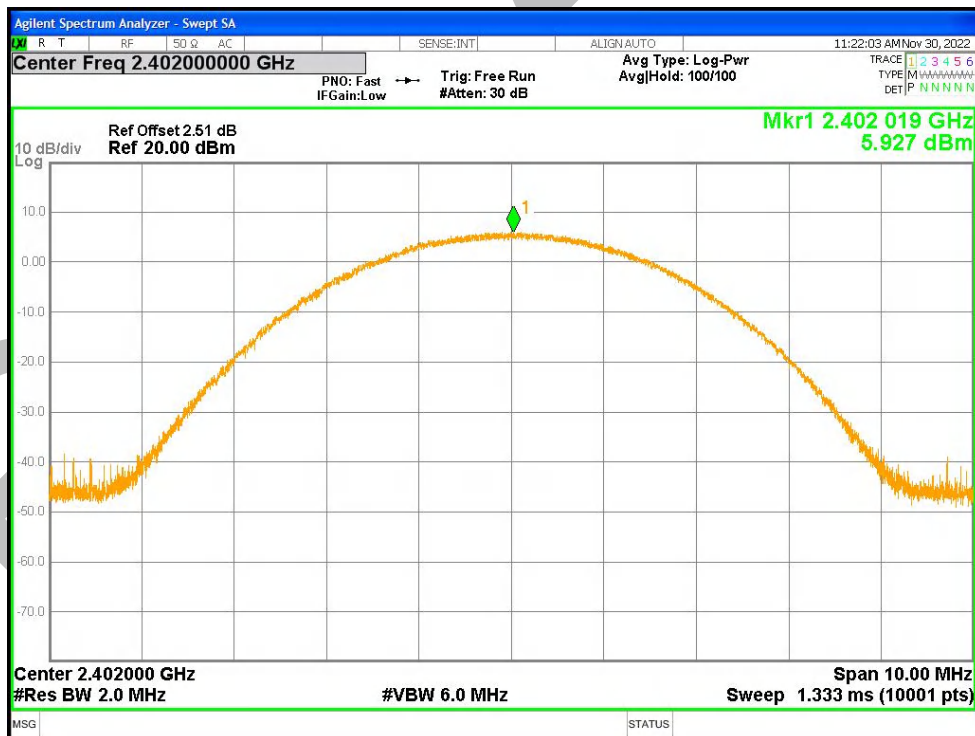
Power NVNT 2-DH1 2441MHz Ant1



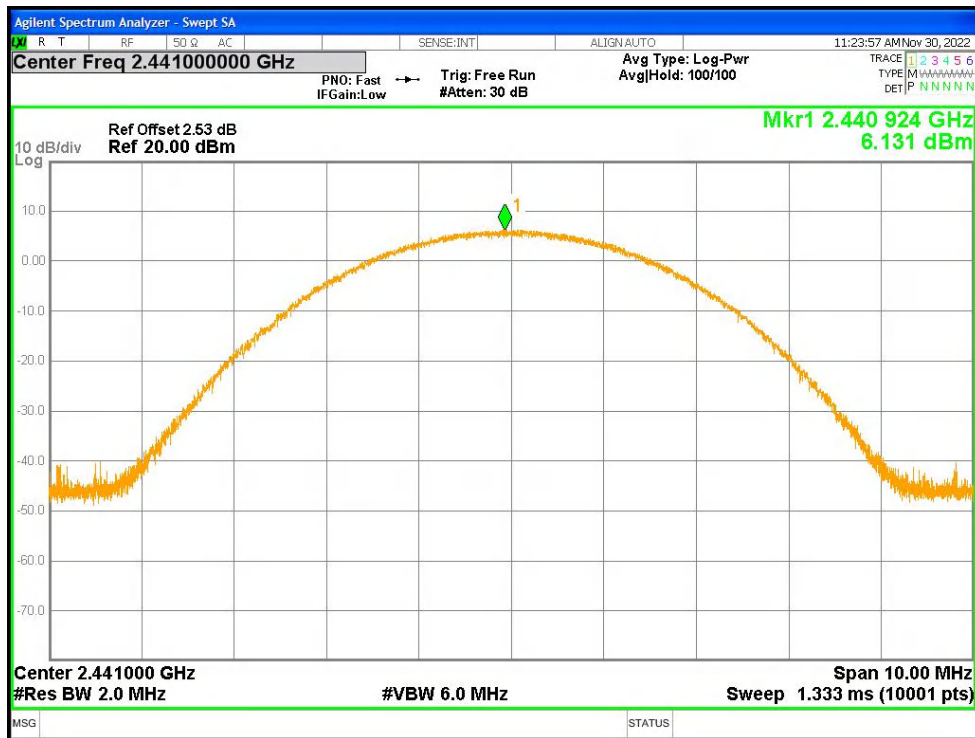
Power NVNT 2-DH1 2480MHz Ant1



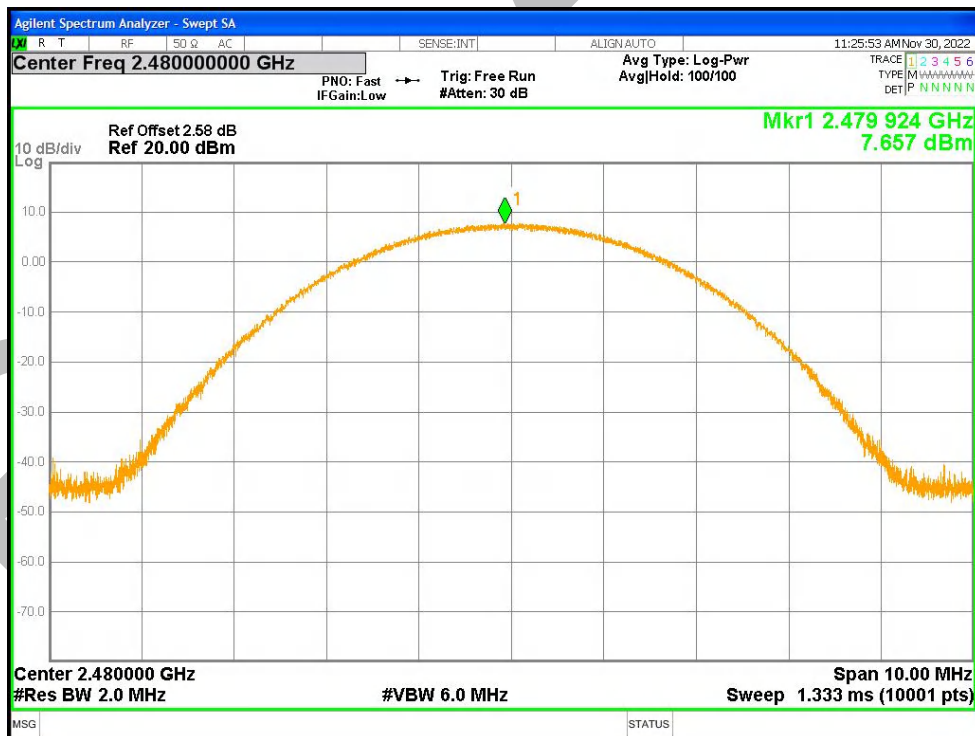
Power NVNT 3-DH1 2402MHz Ant1



Power NVNT 3-DH1 2441MHz Ant1



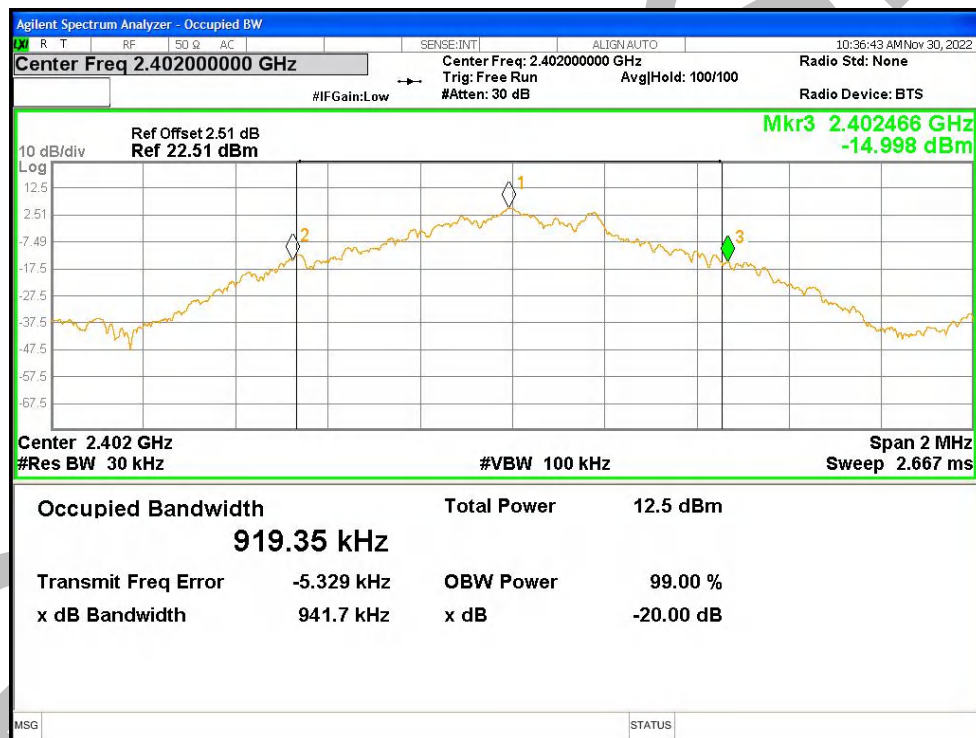
Power NVNT 3-DH1 2480MHz Ant1



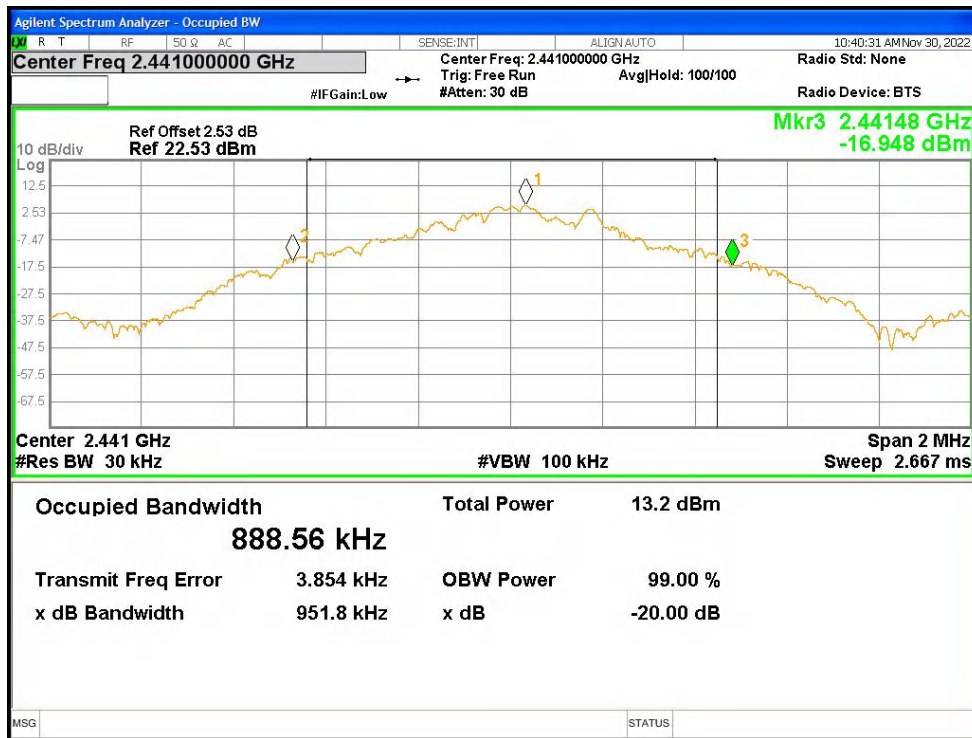
-20dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	Ant1	0.942	0	Pass
NVNT	1-DH1	2441	Ant1	0.952	0	Pass
NVNT	1-DH1	2480	Ant1	0.919	0	Pass
NVNT	2-DH1	2402	Ant1	1.253	0	Pass
NVNT	2-DH1	2441	Ant1	1.249	0	Pass
NVNT	2-DH1	2480	Ant1	1.248	0	Pass
NVNT	3-DH1	2402	Ant1	1.245	0	Pass
NVNT	3-DH1	2441	Ant1	1.251	0	Pass
NVNT	3-DH1	2480	Ant1	1.252	0	Pass

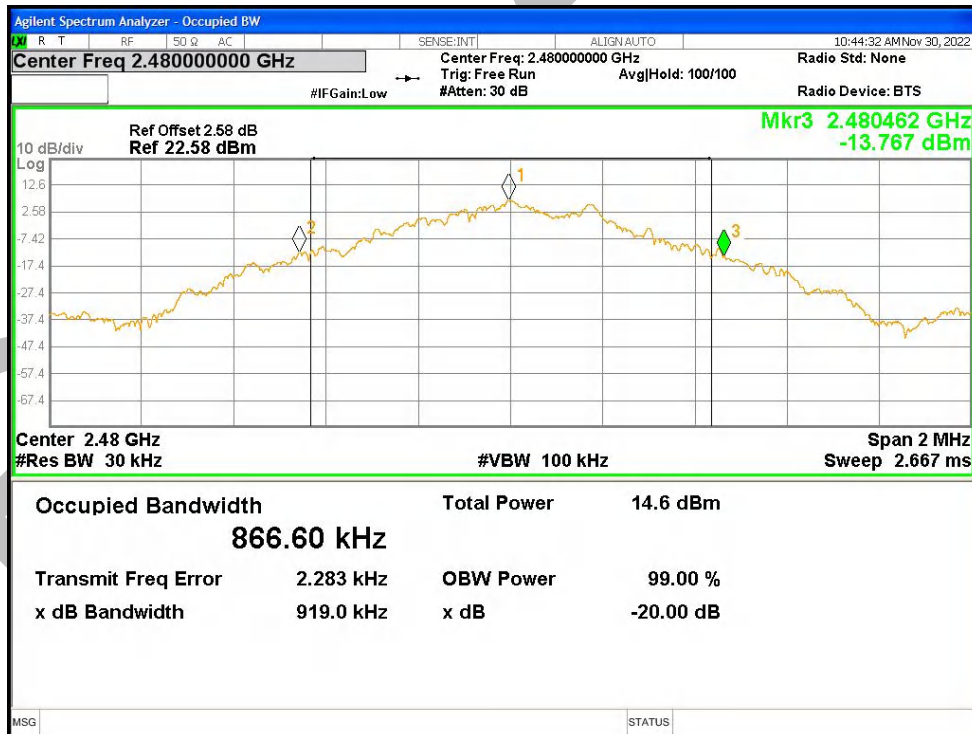
-20dB Bandwidth NVNT 1-DH1 2402MHz Ant1



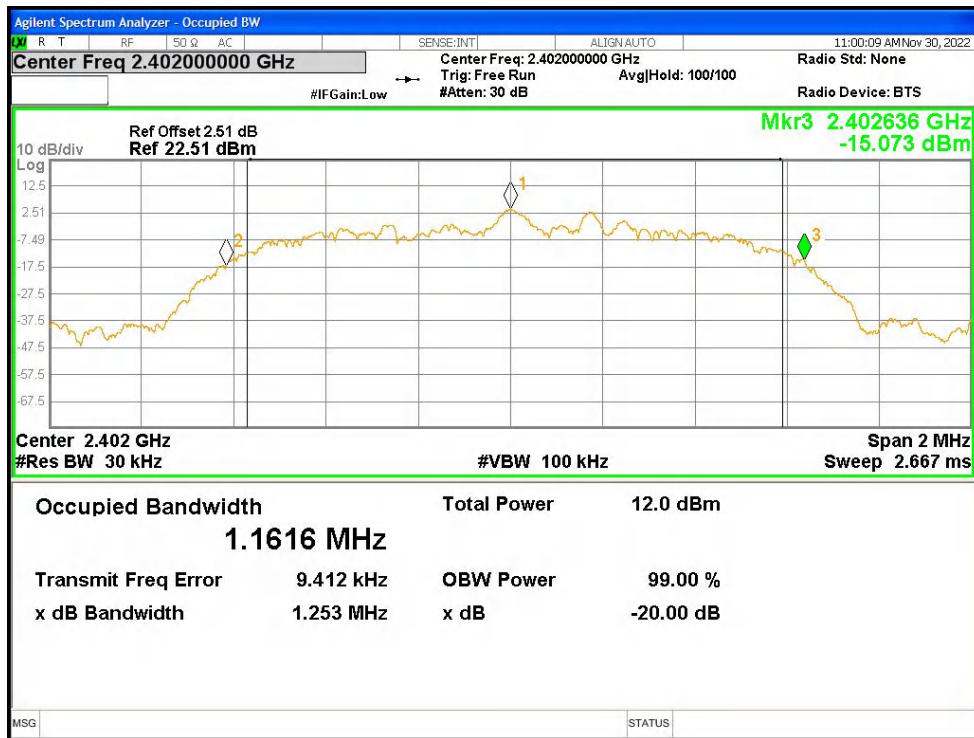
-20dB Bandwidth NVNT 1-DH1 2441MHz Ant1



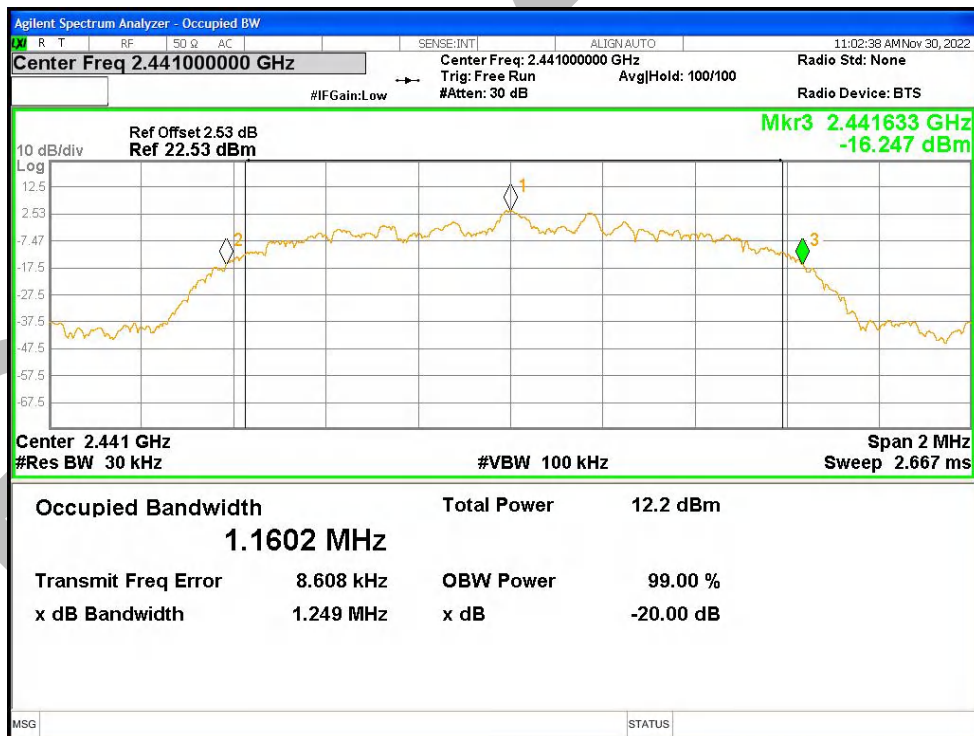
-20dB Bandwidth NVNT 1-DH1 2480MHz Ant1



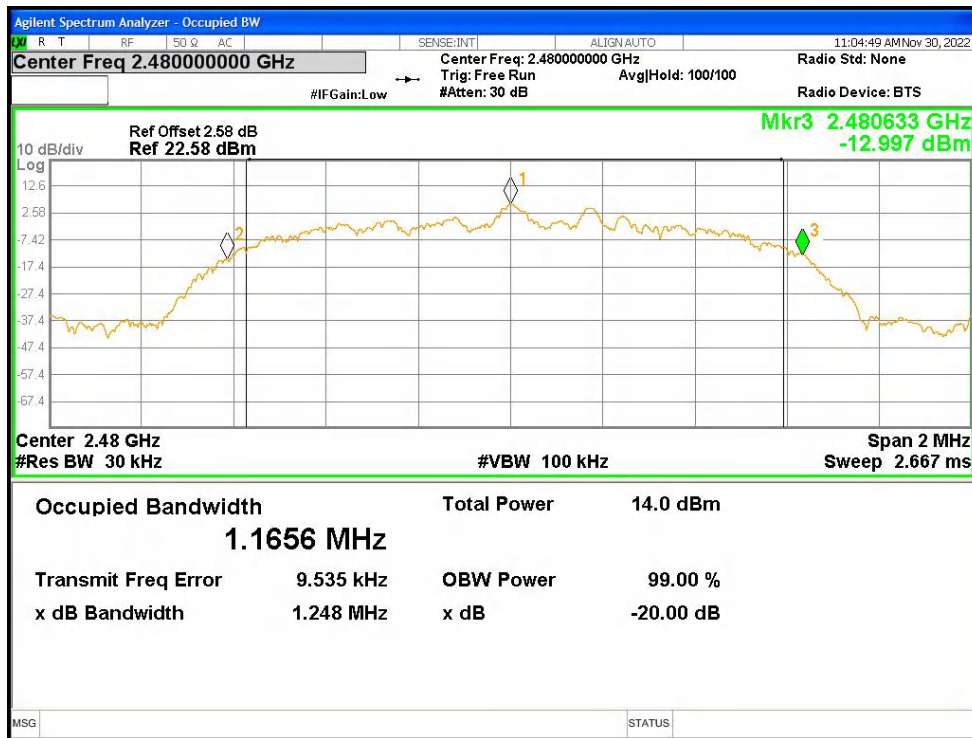
-20dB Bandwidth NVNT 2-DH1 2402MHz Ant1



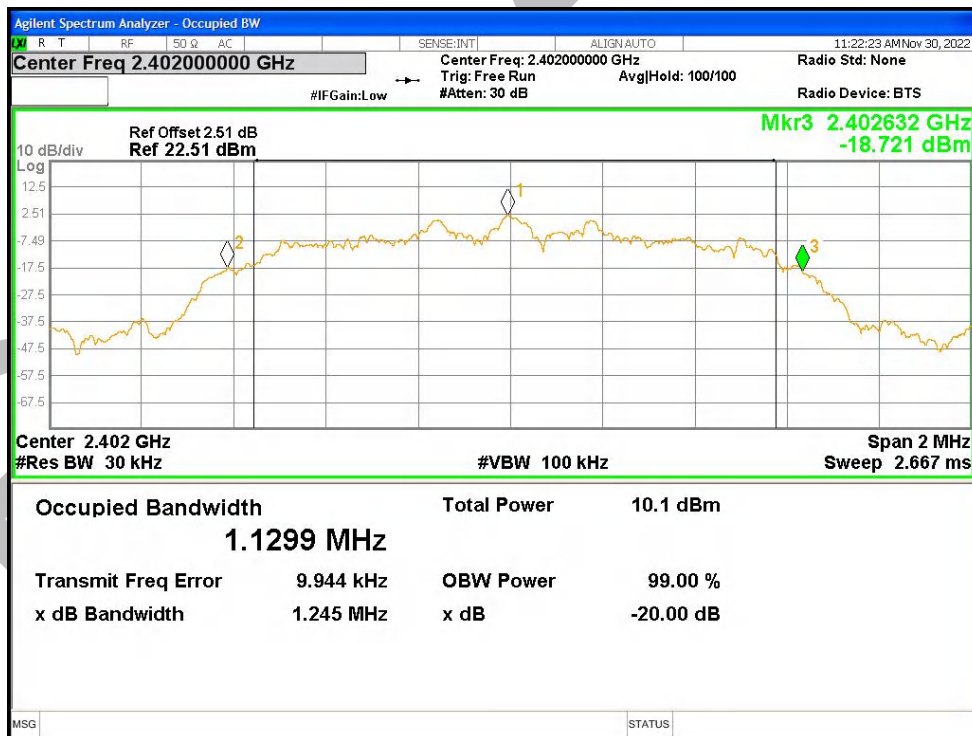
-20dB Bandwidth NVNT 2-DH1 2441MHz Ant1



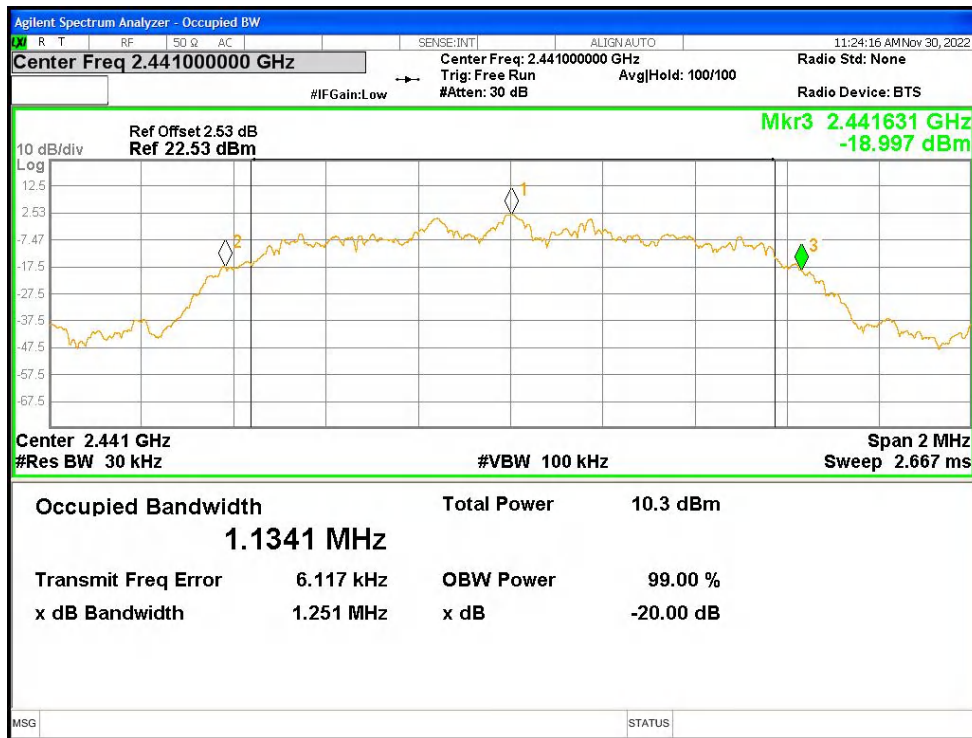
-20dB Bandwidth NVNT 2-DH1 2480MHz Ant1



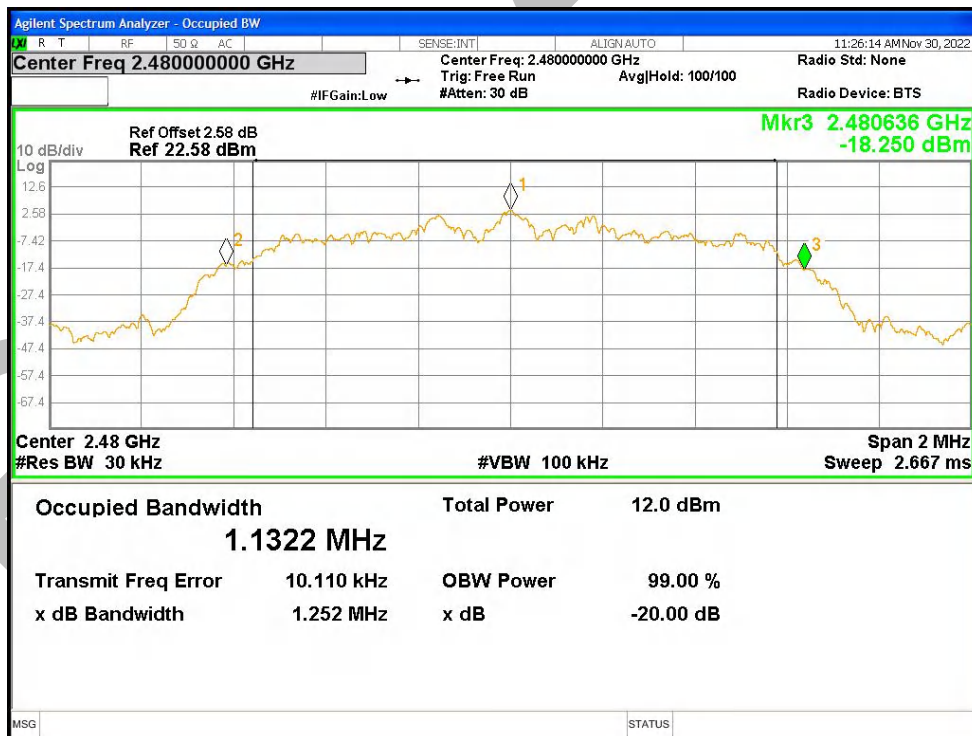
-20dB Bandwidth NVNT 3-DH1 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH1 2441MHz Ant1



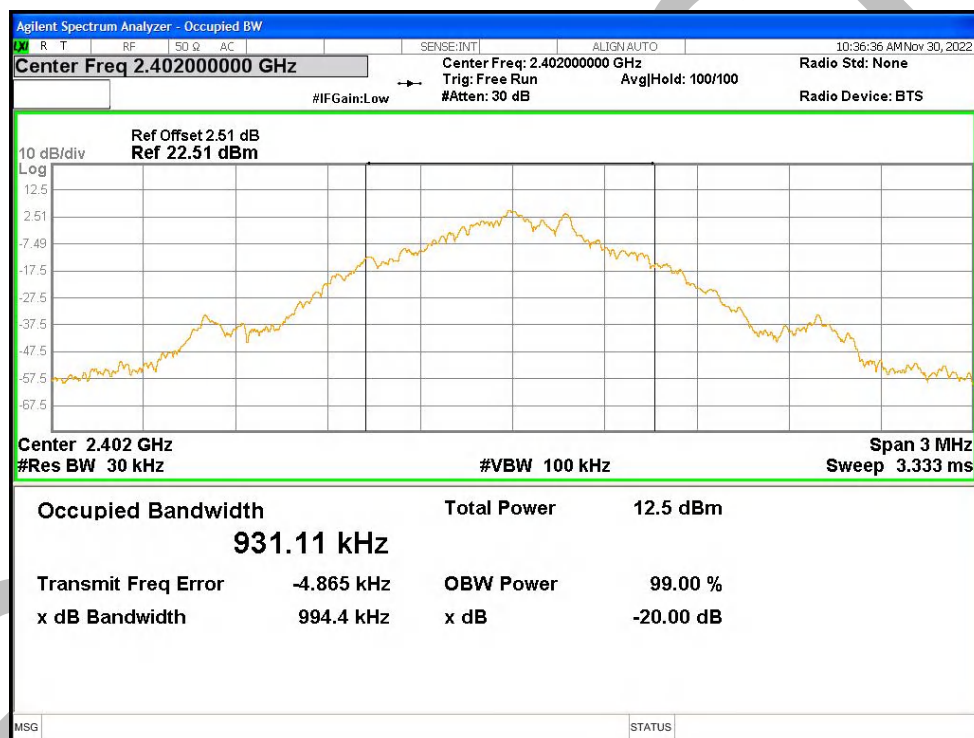
-20dB Bandwidth NVNT 3-DH1 2480MHz Ant1



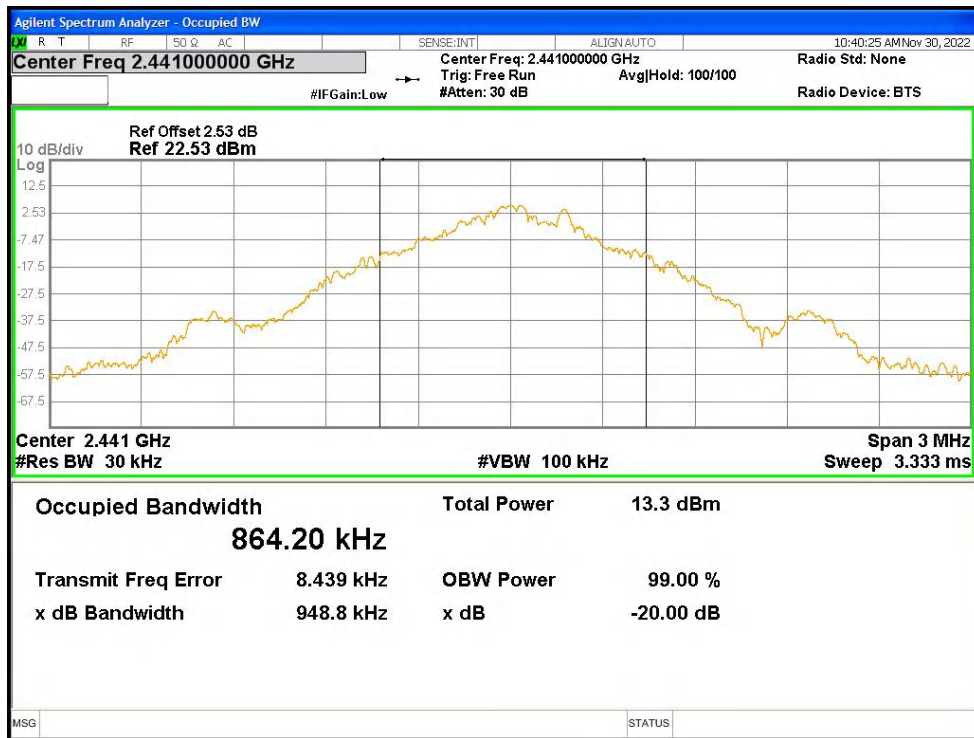
Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	1-DH1	2402	Ant1	0.9311
NVNT	1-DH1	2441	Ant1	0.8642
NVNT	1-DH1	2480	Ant1	0.8655
NVNT	2-DH1	2402	Ant1	1.1635
NVNT	2-DH1	2441	Ant1	1.1611
NVNT	2-DH1	2480	Ant1	1.1658
NVNT	3-DH1	2402	Ant1	1.1265
NVNT	3-DH1	2441	Ant1	1.1364
NVNT	3-DH1	2480	Ant1	1.1314

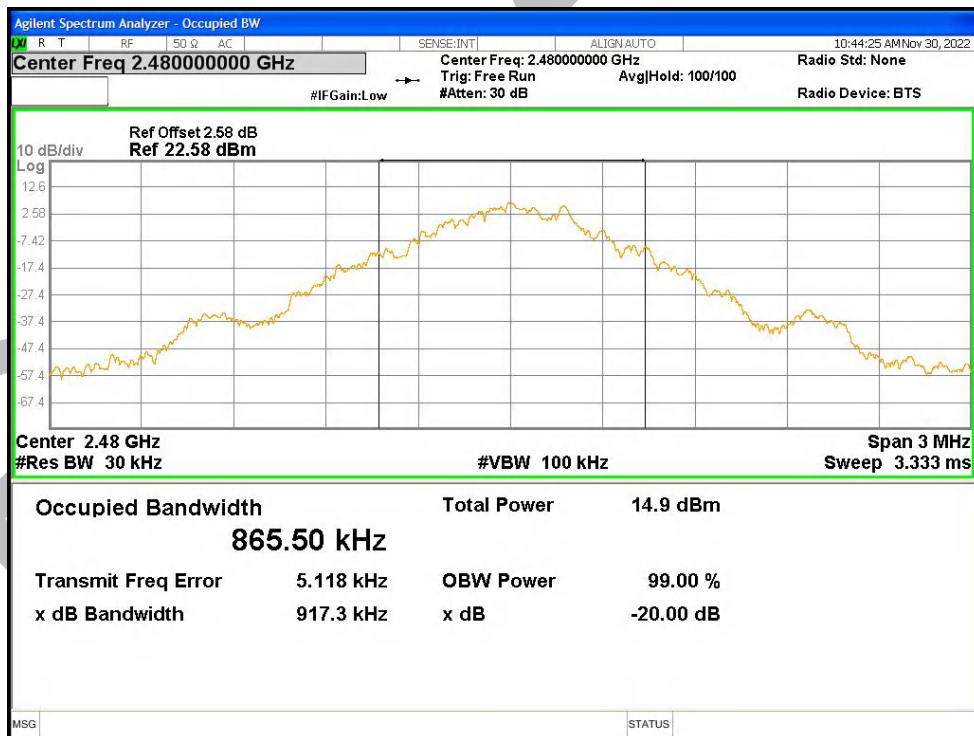
OBW NVNT 1-DH1 2402MHz Ant1



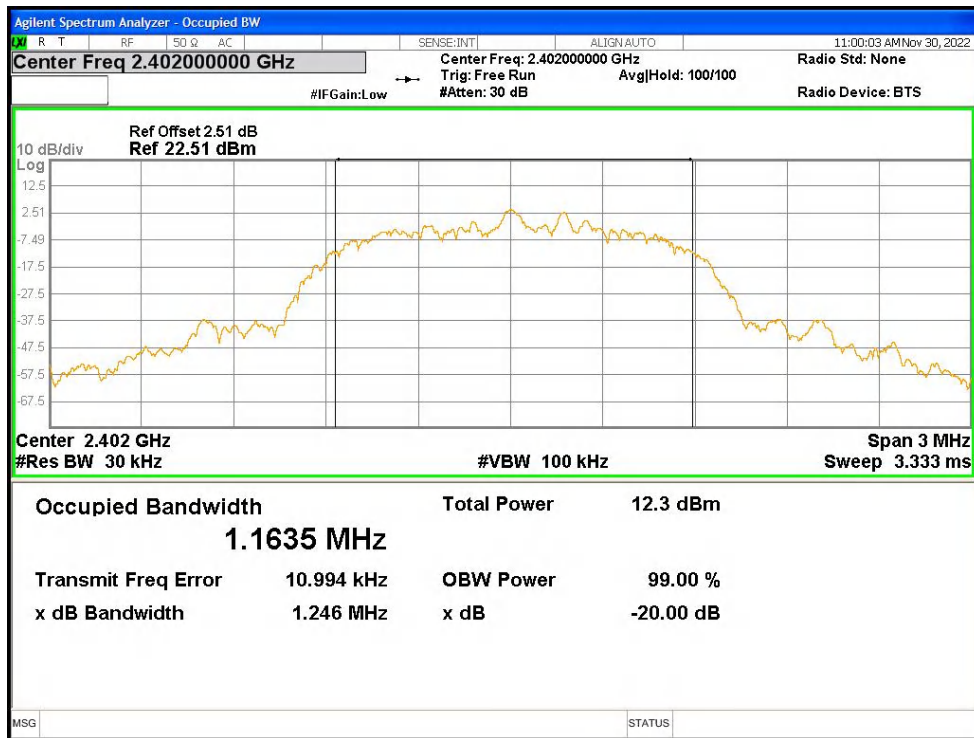
OBW NVNT 1-DH1 2441MHz Ant1



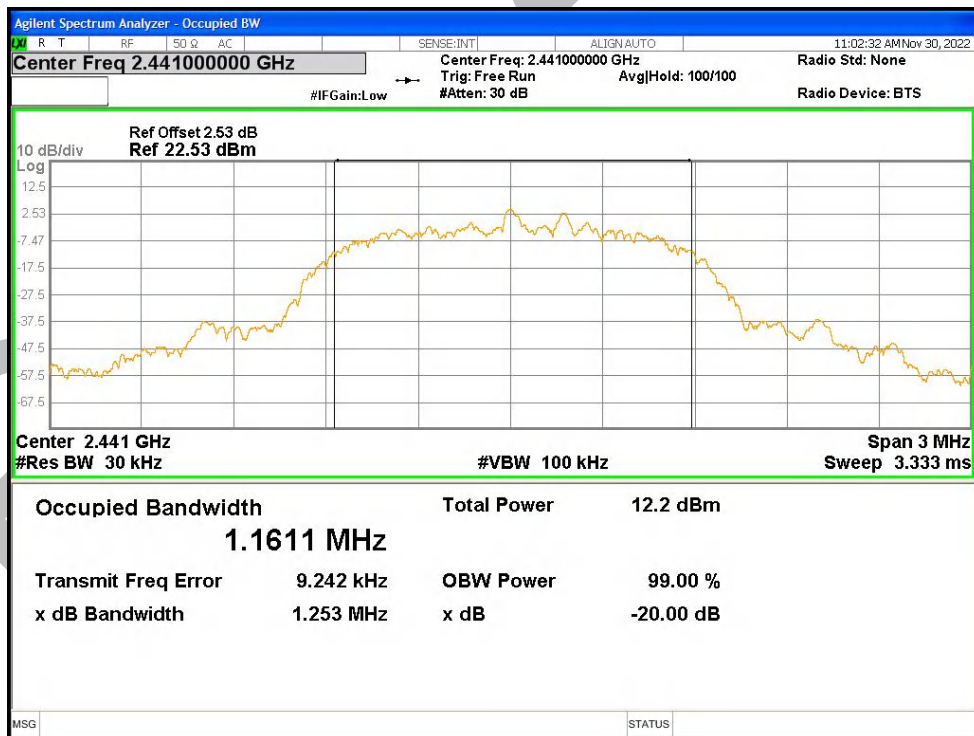
OBW NVNT 1-DH1 2480MHz Ant1



OBW NVNT 2-DH1 2402MHz Ant1



OBW NVNT 2-DH1 2441MHz Ant1



OBW NVNT 2-DH1 2480MHz Ant1