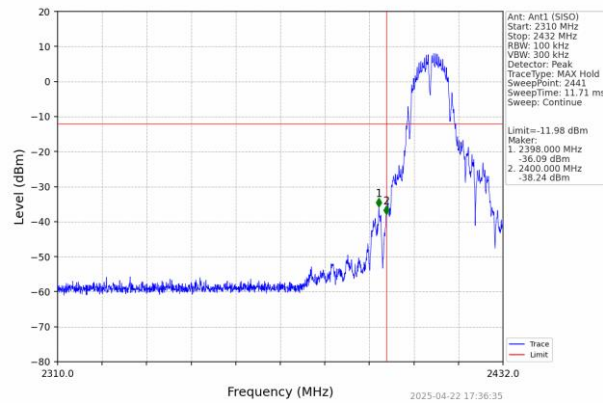


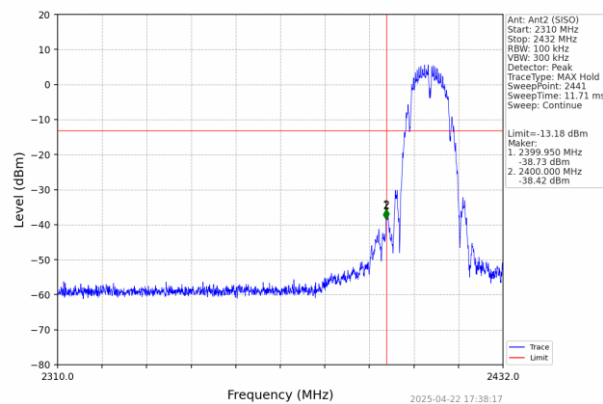


Test plot as follows:

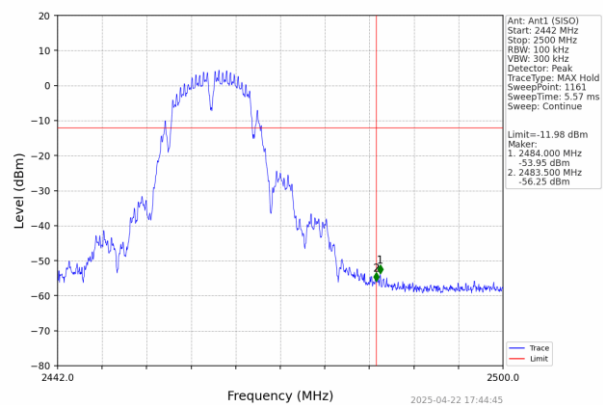
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



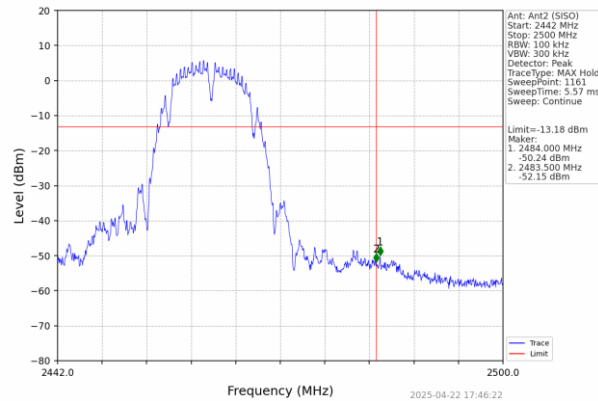
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



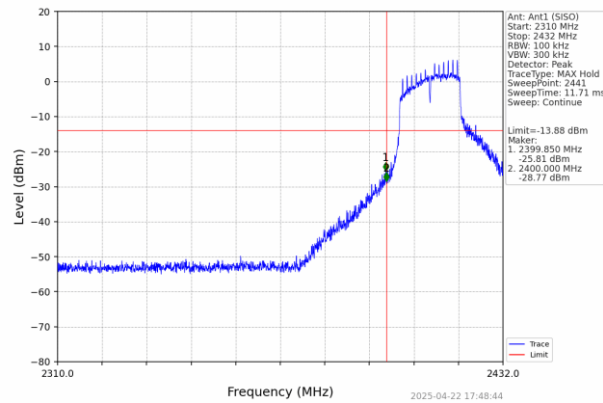


Report No.: HTT202503876F04

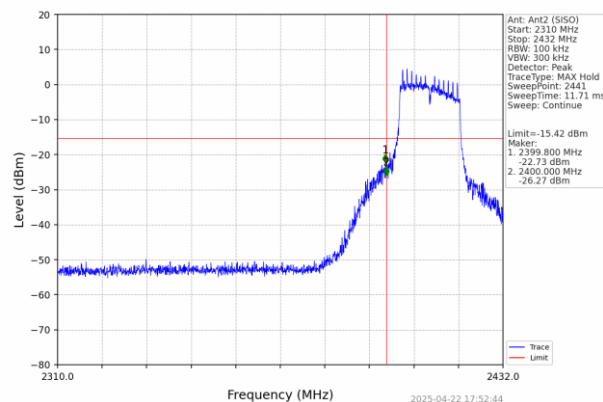
802.11b HCH 2462MHz_Ant2 (SISO) NTNv



802.11g LCH 2412MHz_Ant1 (SISO) NTNv



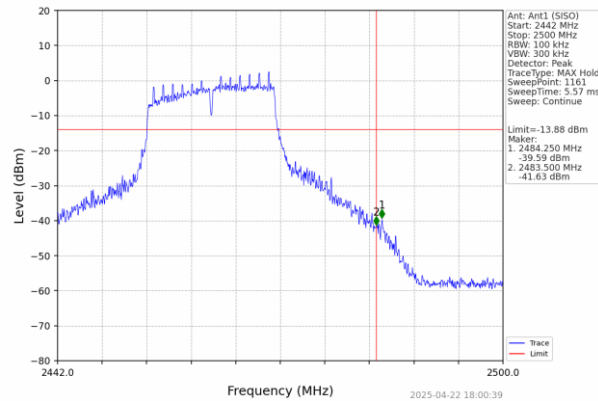
802.11g LCH 2412MHz_Ant2 (SISO) NTNv



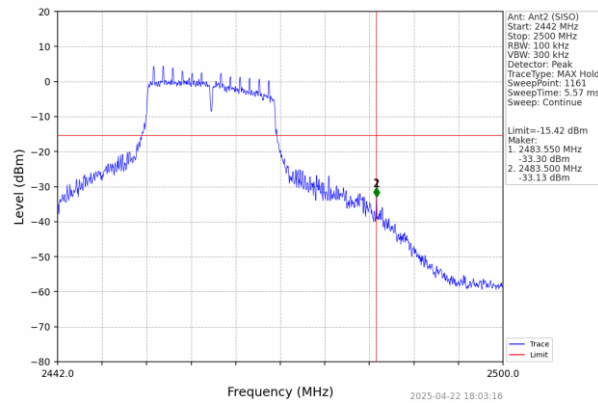


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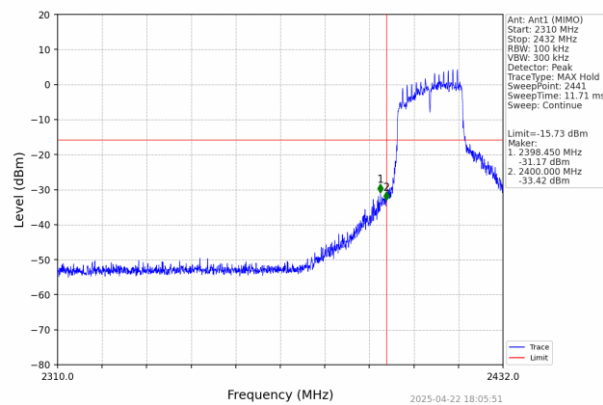
802.11g_HCH_2462MHz_Ant1 (SISO) NTNv



802.11g_HCH_2462MHz_Ant2 (SISO) NTNv



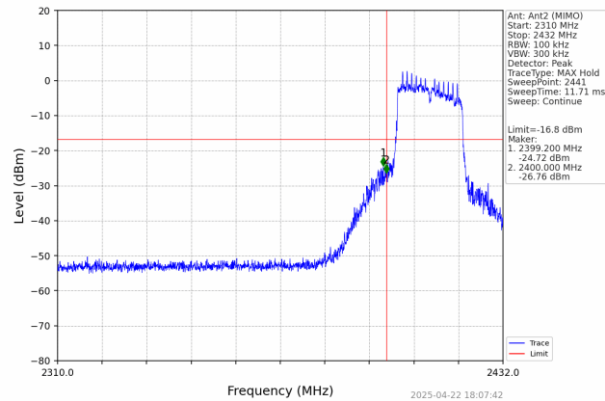
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO) NTNv



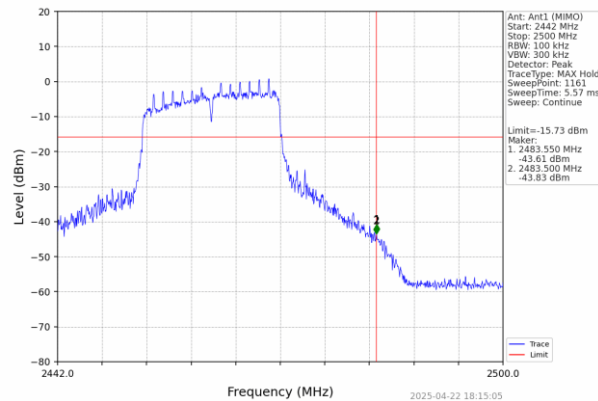


Report No.: HTT202503876F04

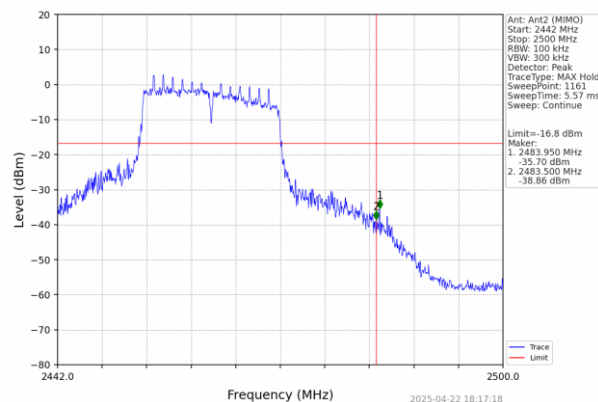
802.11n(HT20) LCH 2412MHz Ant2 (MIMO) NTN



802.11n(HT20) HCH 2462MHz Ant1 (MIMO) NTN



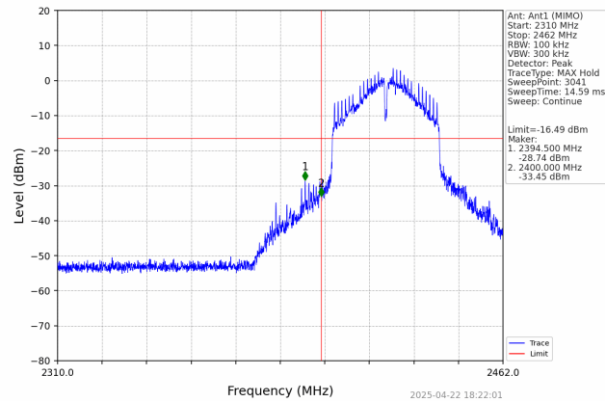
802.11n(HT20) HCH 2462MHz Ant2 (MIMO) NTN



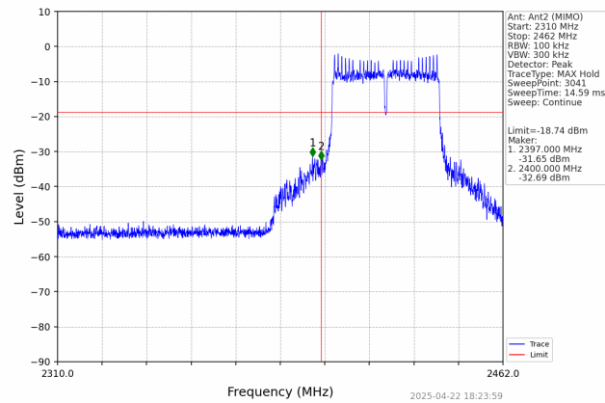


Report No.: HTT202503876F04

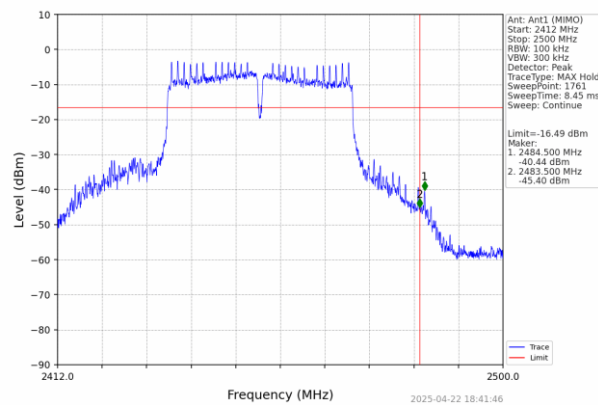
802.11n(HT40) LCH 2422MHz_Ant1 (MIMO) NTN



802.11n(HT40) LCH 2422MHz_Ant2 (MIMO) NTN



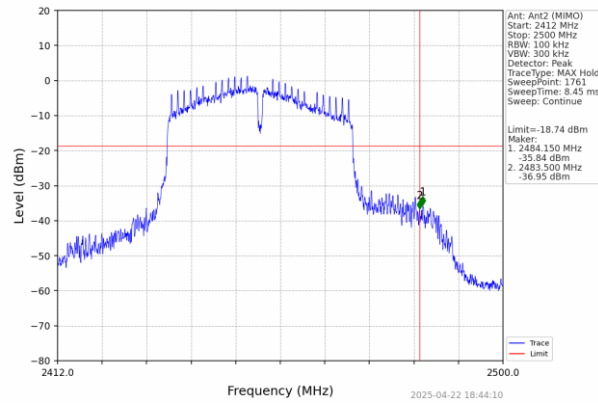
802.11n(HT40) HCH 2452MHz_Ant1 (MIMO) NTN



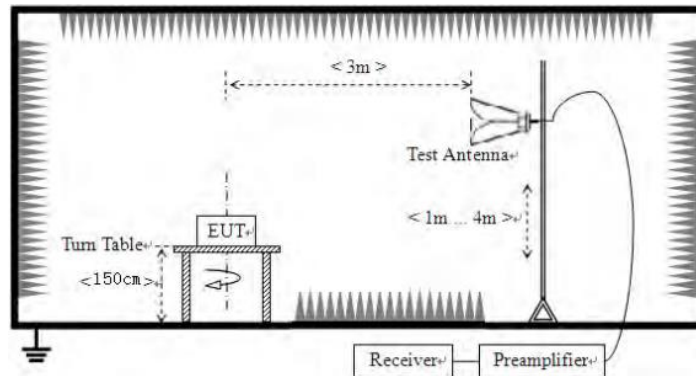


Report No.: HTT202503876F04

802.11n(HT40)_HCH_2452MHz_Ant2 (MIMO)_NTNV



6.5.2. Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205					
Test Method:	ANSI C63.10: 2013					
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.					
Test site:	Measurement Distance: 3m					
Receiver setup:	Frequency	Detector	RBW	VBW	Remark	
	Above 1GHz	Peak	1MHz	3MHz	Peak Value	
		Peak	1MHz	10Hz	Average Value	
Limit:	Frequency		Limit (dBuV/m @3m)		Remark	
	Above 1GHz		54.00		Average Value	
			74.00		Peak Value	
Test setup:						
Test Procedure:	1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar

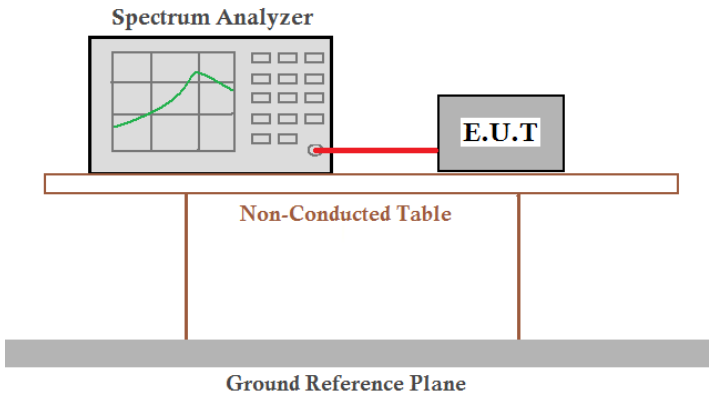
**Measurement Data**

Remark: During the test, pre-scan the 802.11b/802.11g/802.11n (H20)/802.11n (H40) modulation, and found the 802.11n20 MIMO modulation which it is worse case.

Frequency(MHz):			2412		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	60.96	PK	74	13.04	62.35	27.2	4.31	32.9	-1.39
2390.00	43.86	AV	54	10.14	45.25	27.2	4.31	32.9	-1.39
Frequency(MHz):			2412		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	58.92	PK	74	15.08	60.31	27.2	4.31	32.9	-1.39
2390.00	46.25	AV	54	7.75	47.64	27.2	4.31	32.9	-1.39
Frequency(MHz):			2462		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	57.10	PK	74	16.90	58.03	27.4	4.47	32.8	-0.93
2483.50	44.84	AV	54	9.16	45.77	27.4	4.47	32.8	-0.93
Frequency(MHz):			2462		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	55.99	PK	74	18.01	56.92	27.4	4.47	32.8	-0.93
2483.50	44.62	AV	54	9.38	45.55	27.4	4.47	32.8	-0.93

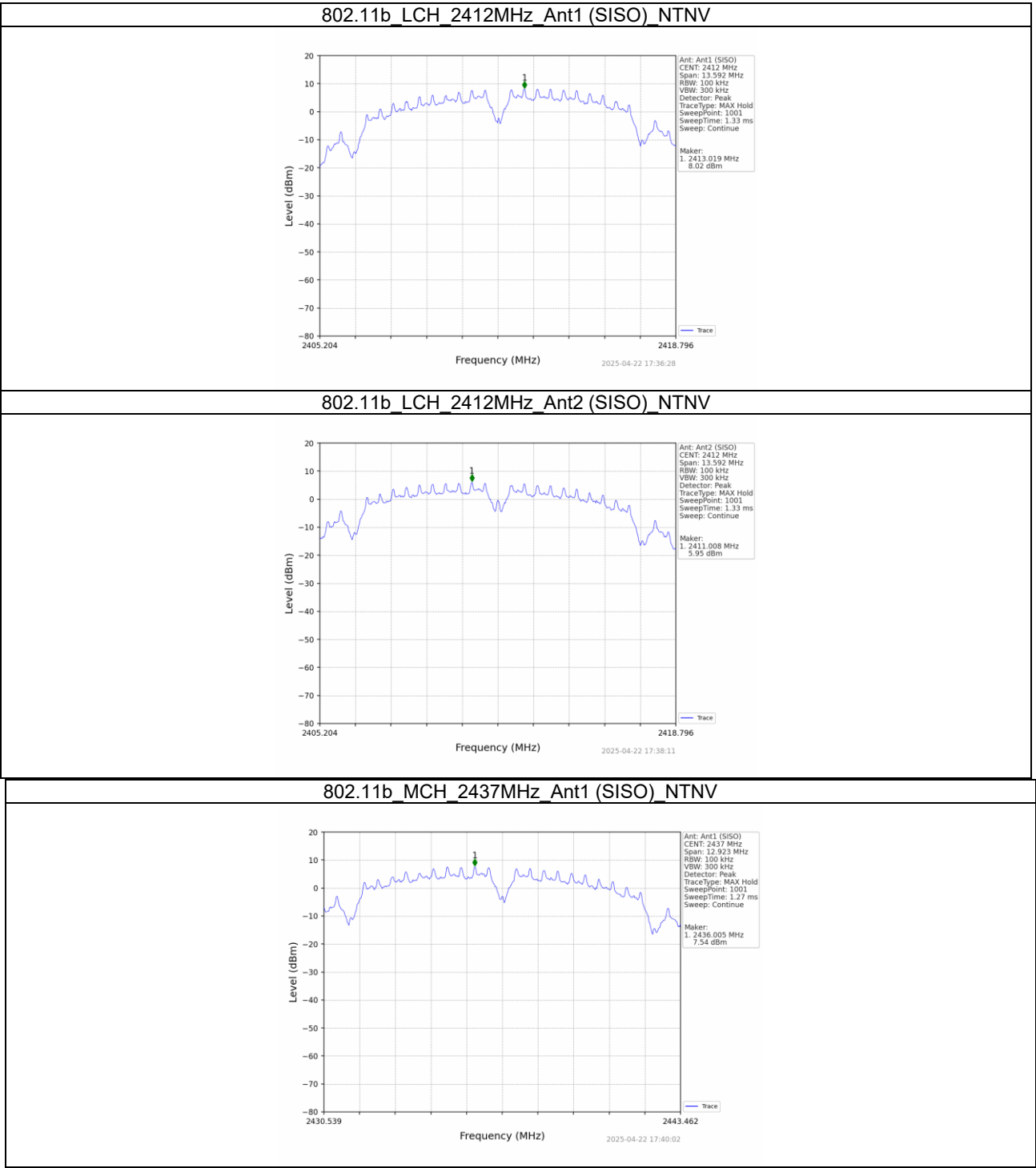
6.6. Spurious Emission

6.6.1. Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)					
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02					
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.					
Test setup:	 The diagram illustrates the test setup for conducted emission measurement. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test results:	Pass					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar



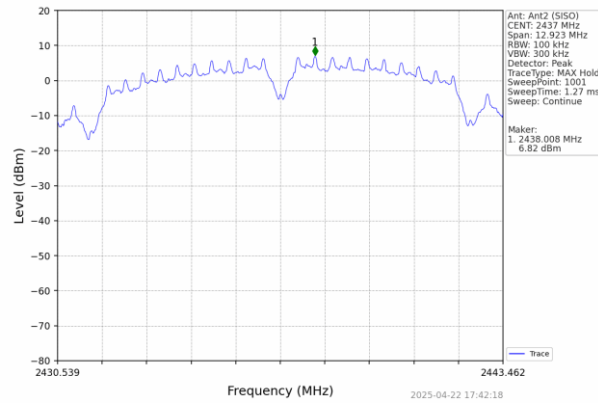
Measurement Data:



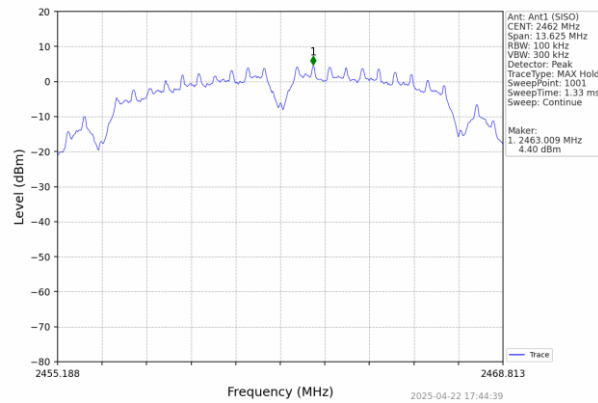


Report No.: HTT202503876F04

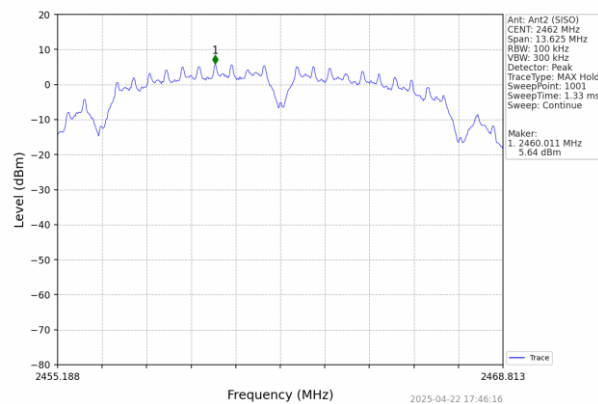
802.11b MCH 2437MHz_Ant2 (SISO) NTN



802.11b HCH 2462MHz_Ant1 (SISO) NTN



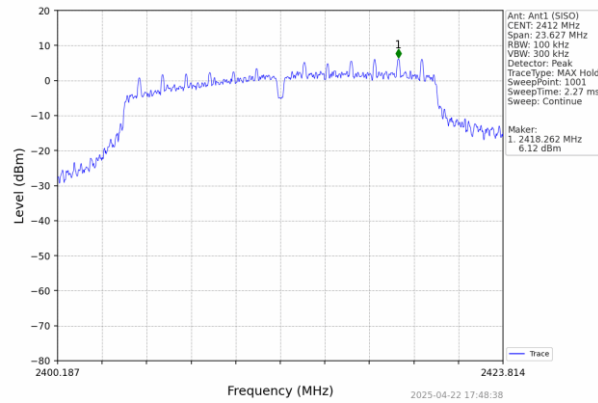
802.11b HCH 2462MHz_Ant2 (SISO) NTN



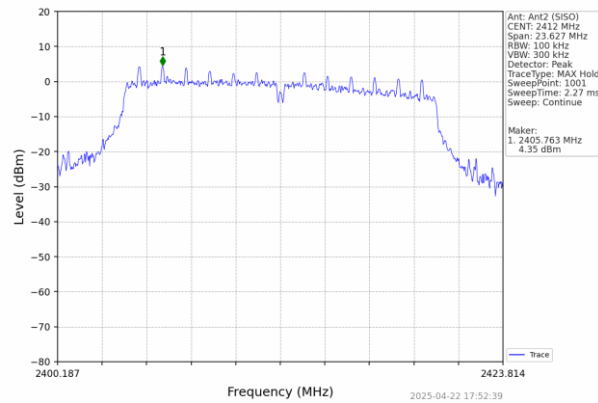


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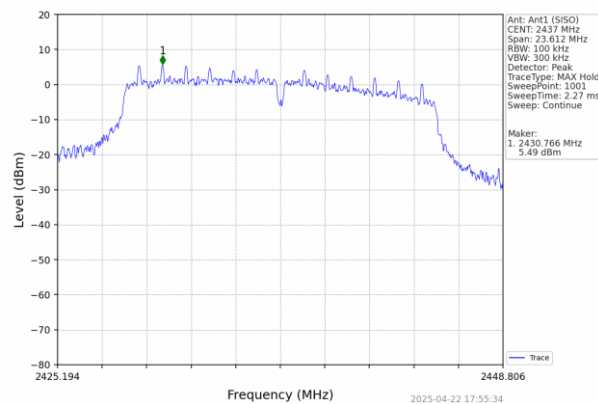
802.11g LCH 2412MHz_Ant1 (SISO) NTNv



802.11g LCH 2412MHz_Ant2 (SISO) NTNv



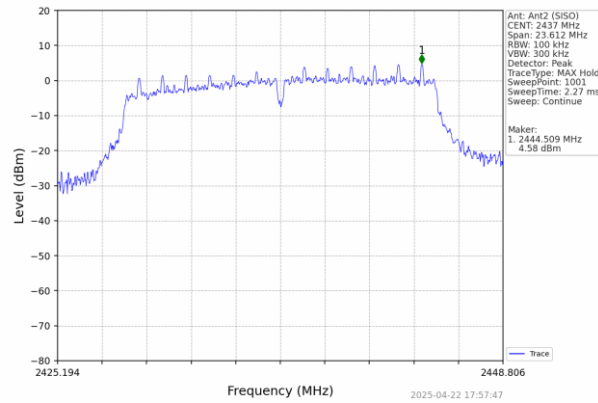
802.11g MCH 2437MHz_Ant1 (SISO) NTNv



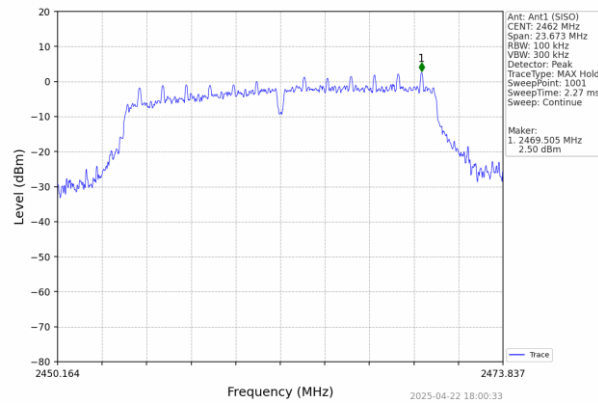


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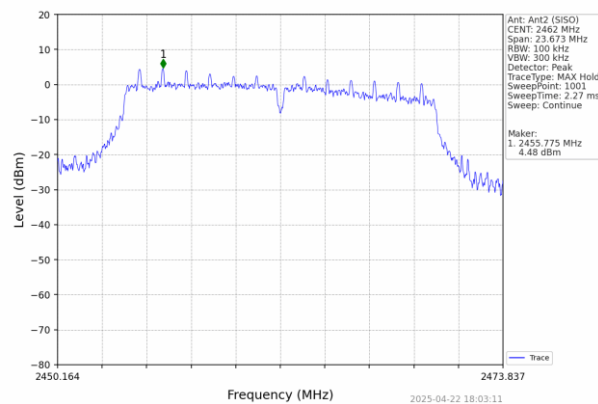
802.11g MCH 2437MHz_Ant2 (SISO) NTNv



802.11g HCH 2462MHz_Ant1 (SISO) NTNv



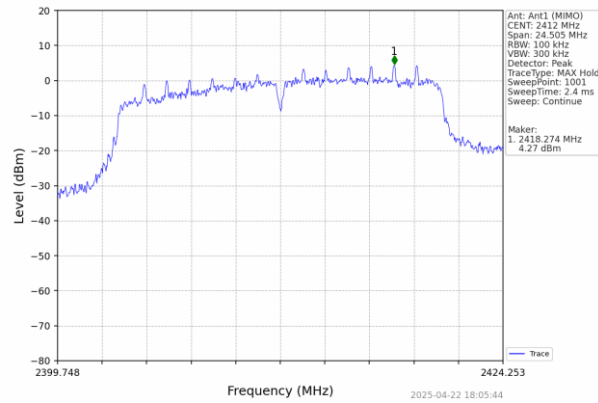
802.11g HCH 2462MHz_Ant2 (SISO) NTNv



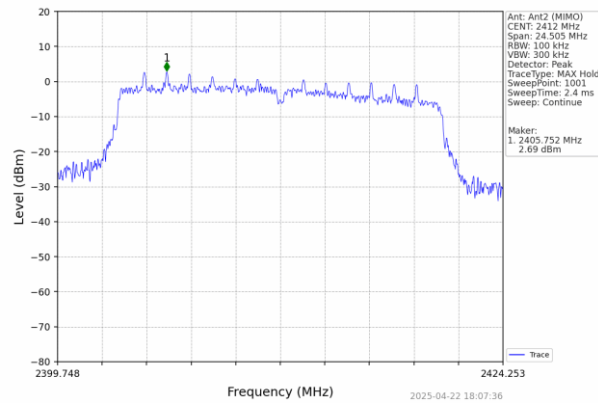


Report No.: HTT202503876F04

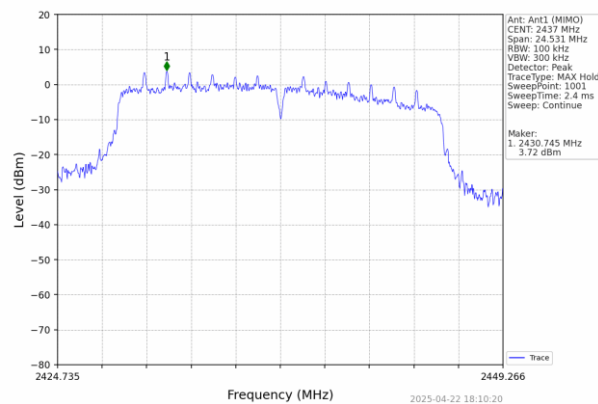
802.11n(HT20) LCH 2412MHz_Ant1 (MIMO) NTNv



802.11n(HT20) LCH 2412MHz_Ant2 (MIMO) NTNv



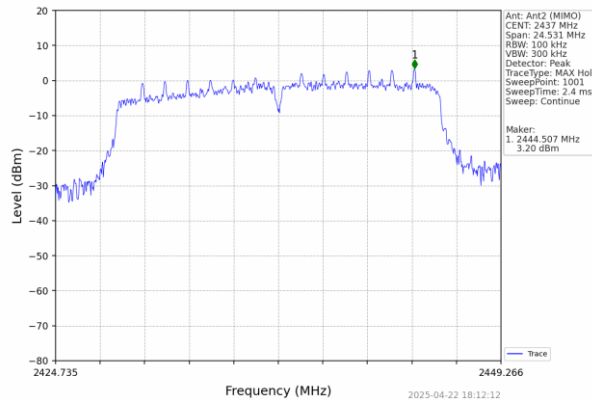
802.11n(HT20) MCH 2437MHz_Ant1 (MIMO) NTNv



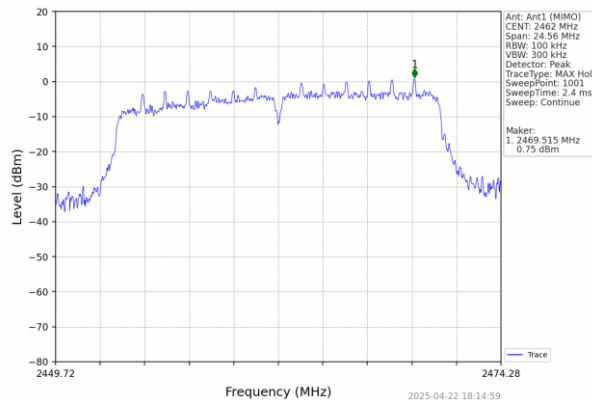


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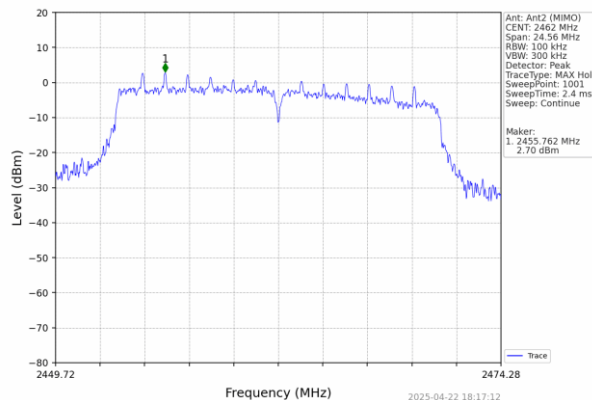
802.11n(HT20) MCH 2437MHz_Ant2 (MIMO) NTN



802.11n(HT20) HCH 2462MHz_Ant1 (MIMO) NTN



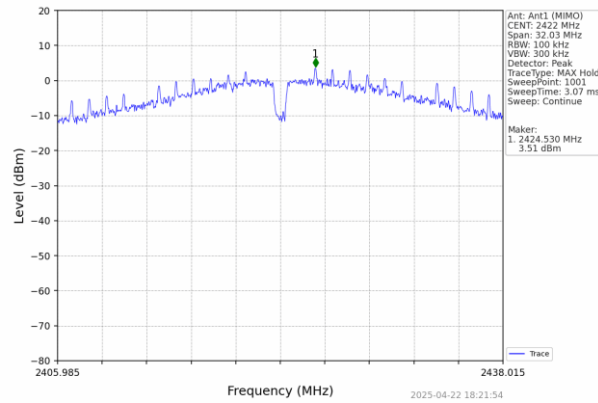
802.11n(HT20) HCH 2462MHz_Ant2 (MIMO) NTN



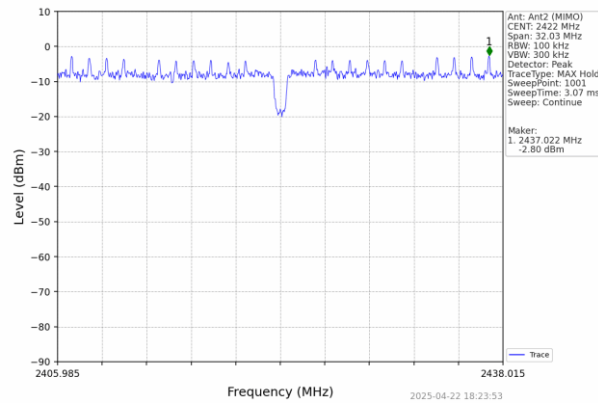


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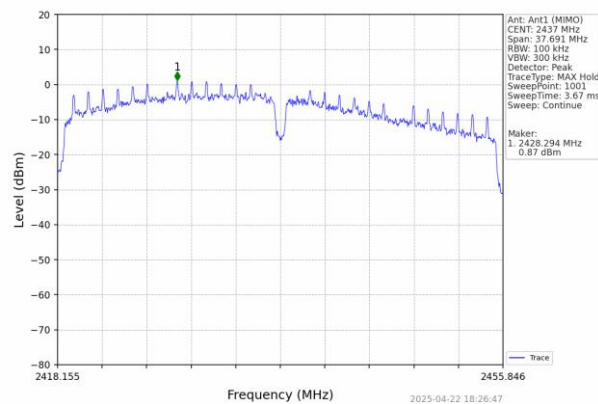
802.11n(HT40) LCH 2422MHz_Ant1 (MIMO) NTNv



802.11n(HT40) LCH 2422MHz_Ant2 (MIMO) NTNv



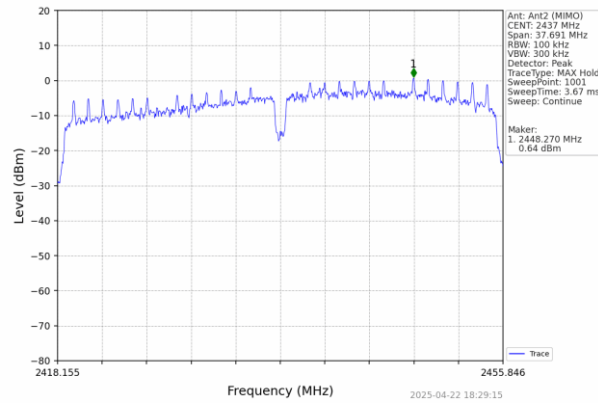
802.11n(HT40) MCH 2437MHz_Ant1 (MIMO) NTNv



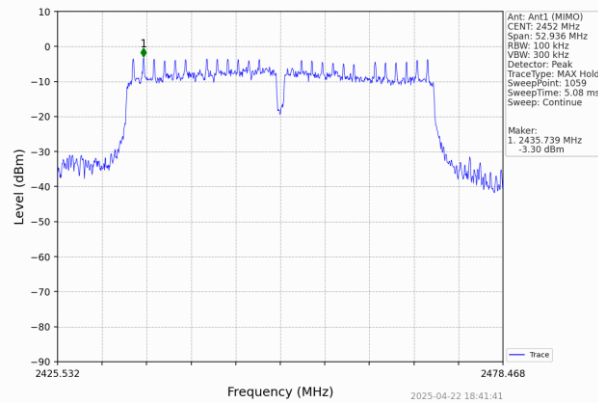


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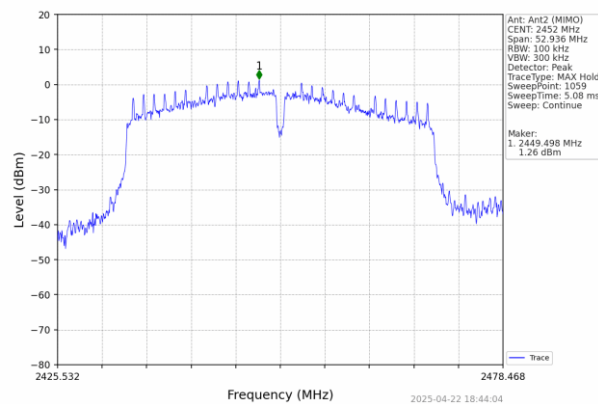
802.11n(HT40) MCH 2437MHz_Ant2 (MIMO) NTN



802.11n(HT40) HCH 2452MHz_Ant1 (MIMO) NTN



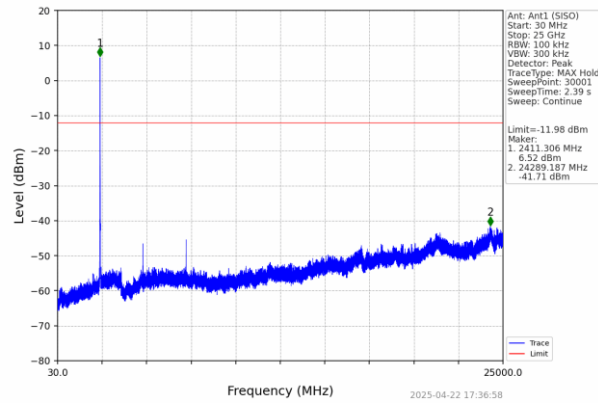
802.11n(HT40) HCH 2452MHz_Ant2 (MIMO) NTN



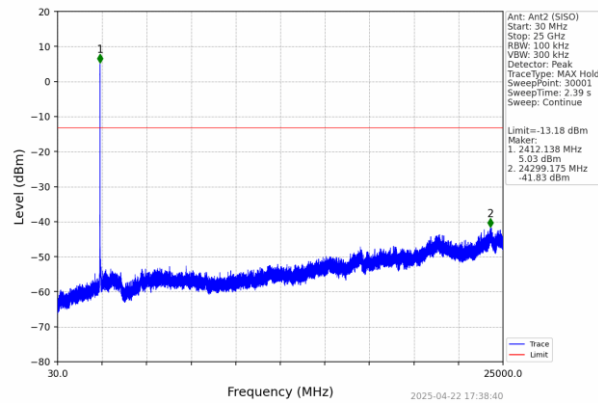


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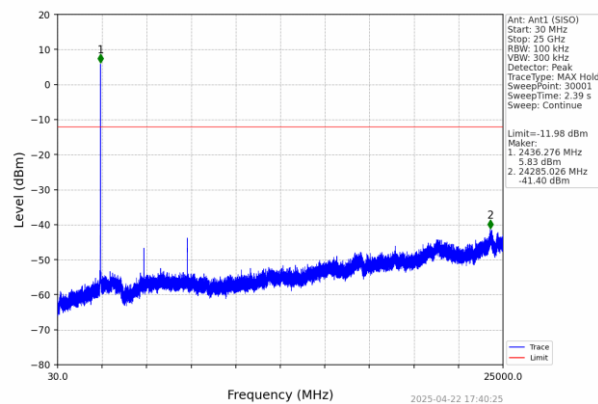
802.11b LCH 2412MHz_Ant1 (SISO) NTNv



802.11b LCH 2412MHz_Ant2 (SISO) NTNv



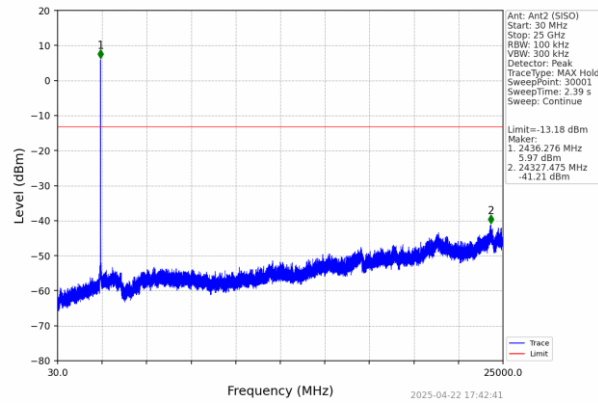
802.11b MCH 2437MHz_Ant1 (SISO) NTNv



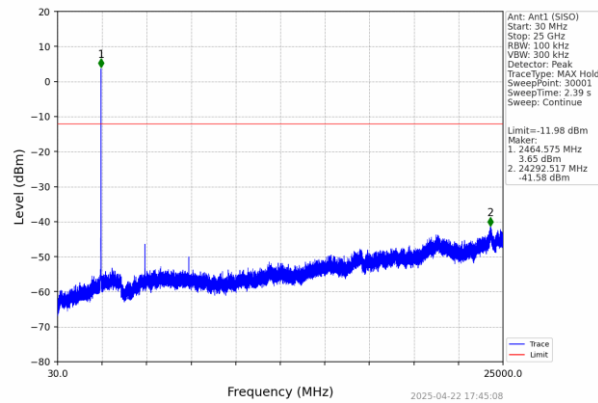


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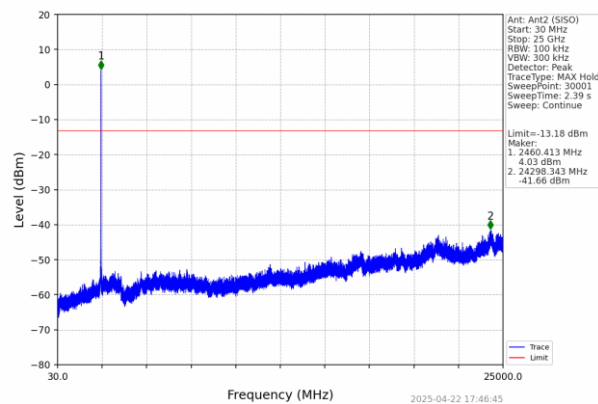
802.11b MCH 2437MHz_Ant2 (SISO) NTNv



802.11b HCH 2462MHz_Ant1 (SISO) NTNv



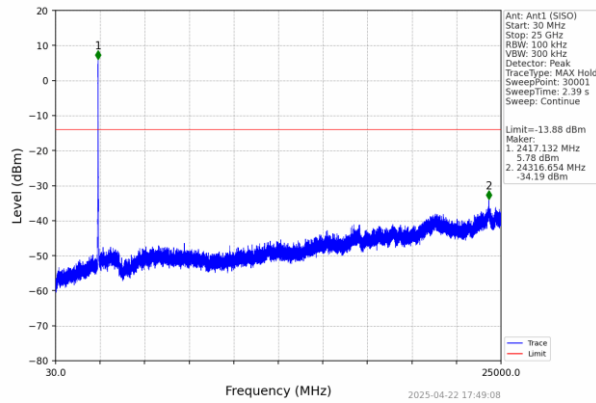
802.11b HCH 2462MHz_Ant2 (SISO) NTNv



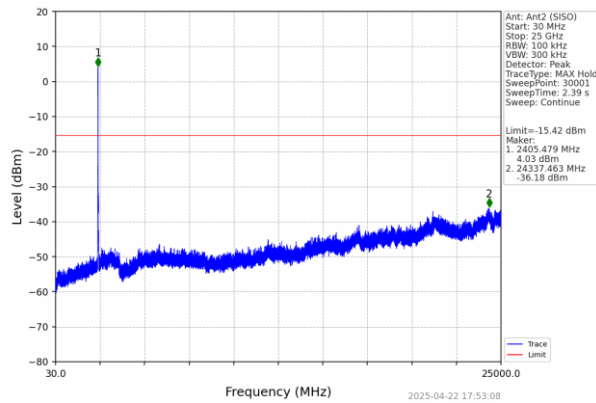


Report No.: HTT202503876F04

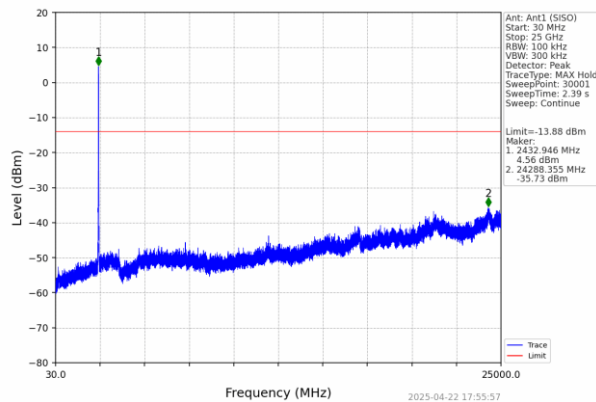
802.11g LCH 2412MHz_Ant1 (SISO) NTNv



802.11g LCH 2412MHz_Ant2 (SISO) NTNv



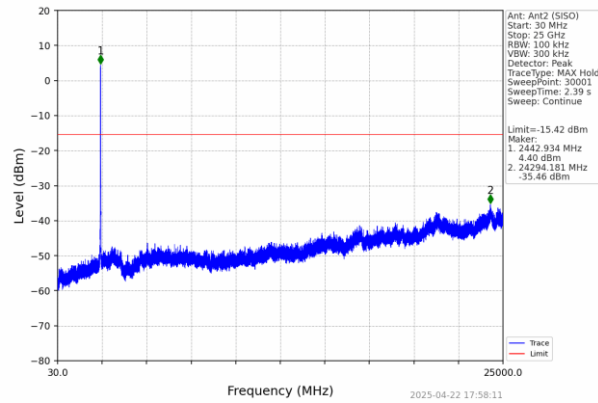
802.11g MCH 2437MHz_Ant1 (SISO) NTNv



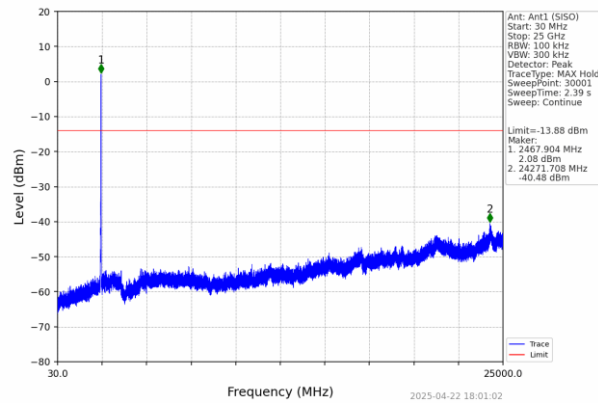


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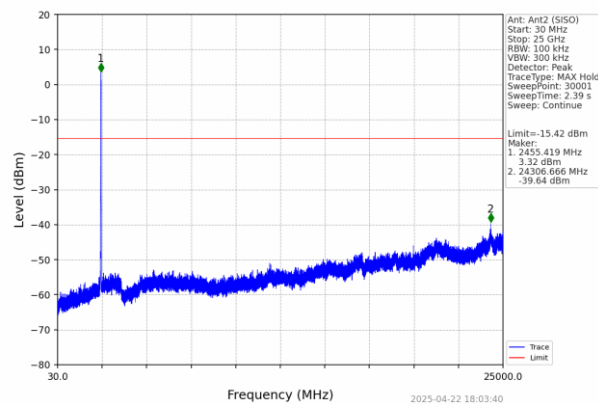
802.11g MCH 2437MHz_Ant2 (SISO) NTN



802.11g HCH 2462MHz_Ant1 (SISO) NTN



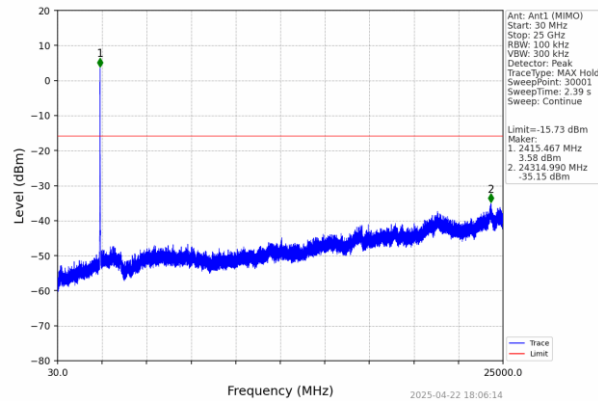
802.11g HCH 2462MHz_Ant2 (SISO) NTN



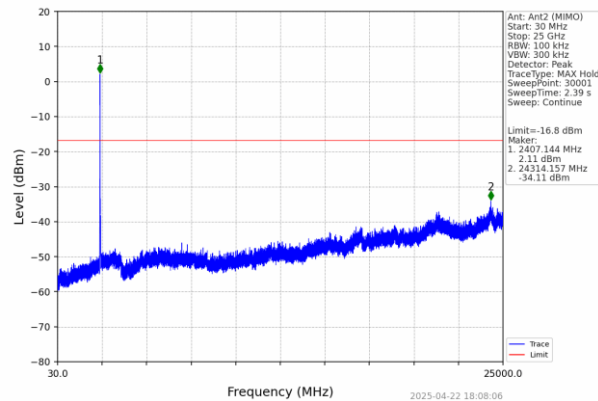


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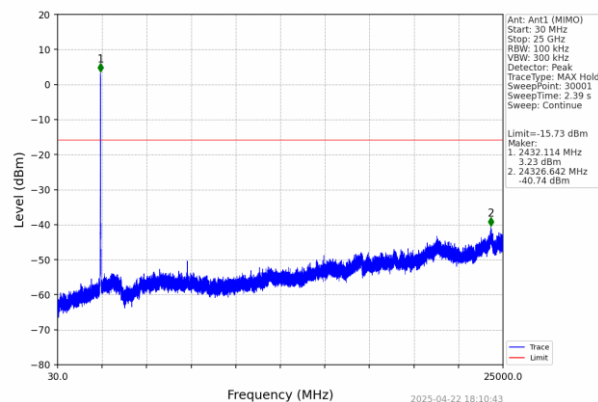
802.11n(HT20) LCH 2412MHz_Ant1 (MIMO) NTNv



802.11n(HT20) LCH 2412MHz_Ant2 (MIMO) NTNv



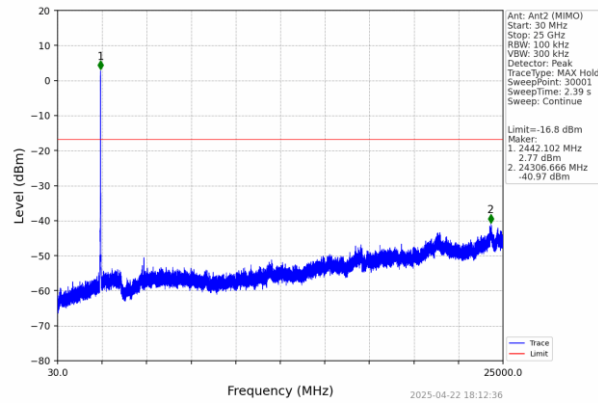
802.11n(HT20) MCH 2437MHz_Ant1 (MIMO) NTNv



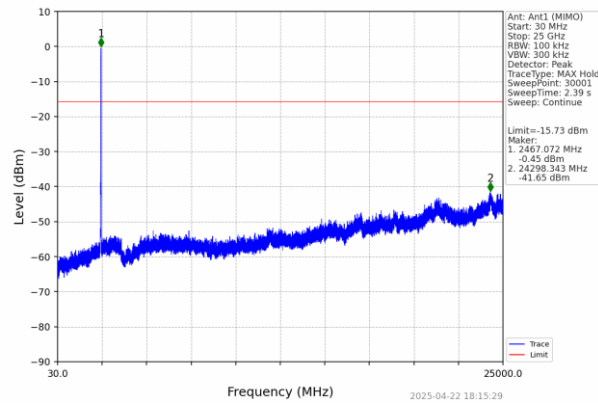


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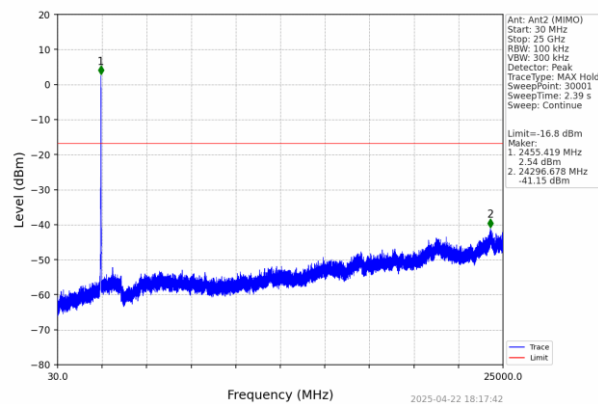
802.11n(HT20) MCH 2437MHz_Ant2 (MIMO) NTNv



802.11n(HT20) HCH 2462MHz_Ant1 (MIMO) NTNv



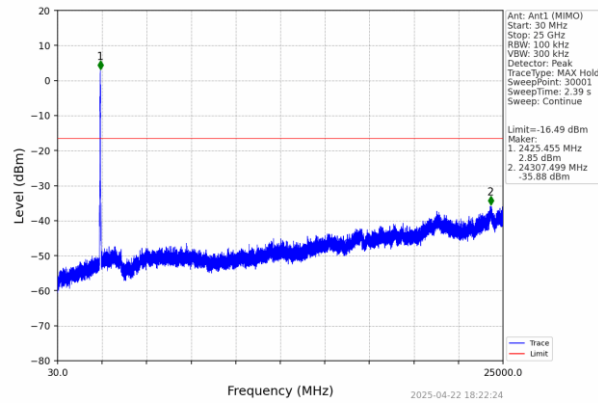
802.11n(HT20) HCH 2462MHz_Ant2 (MIMO) NTNv



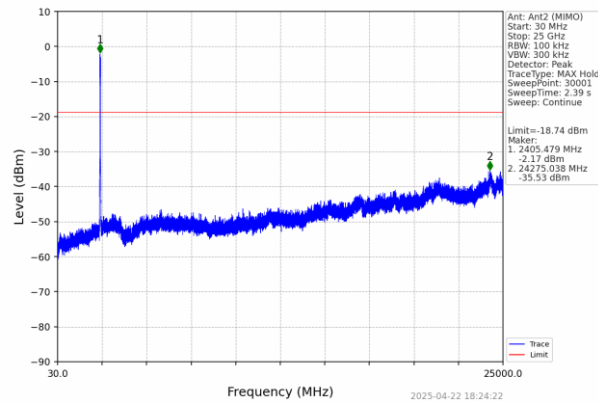


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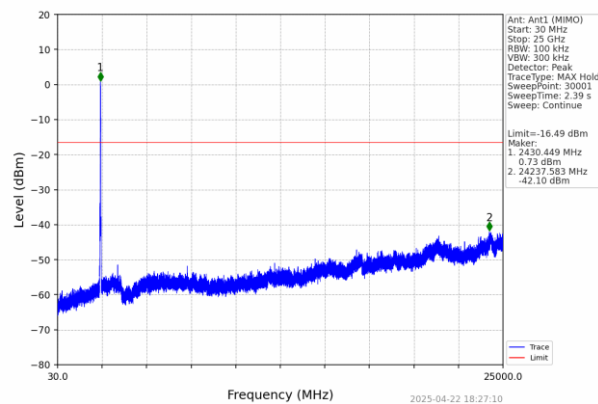
802.11n(HT40) LCH 2422MHz_Ant1 (MIMO) NTNv



802.11n(HT40) LCH 2422MHz_Ant2 (MIMO) NTNv



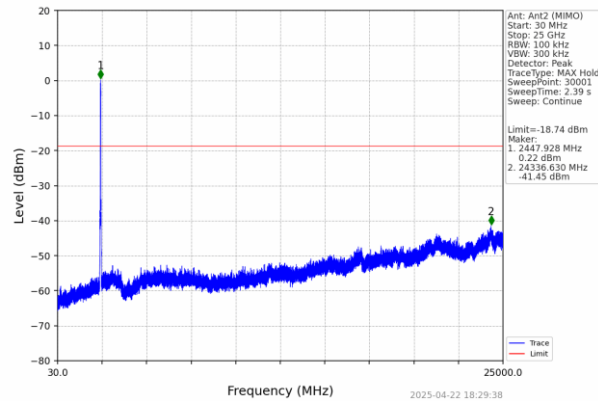
802.11n(HT40) MCH 2437MHz_Ant1 (MIMO) NTNv



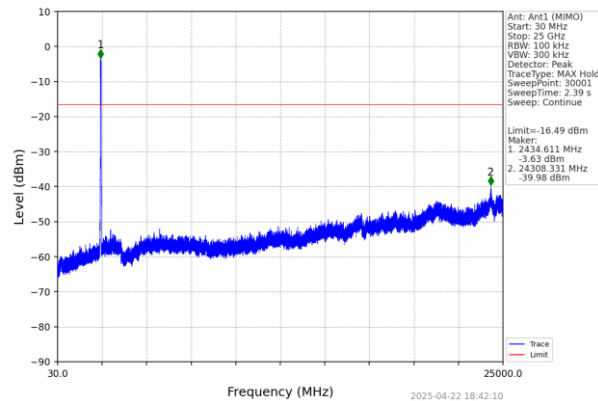


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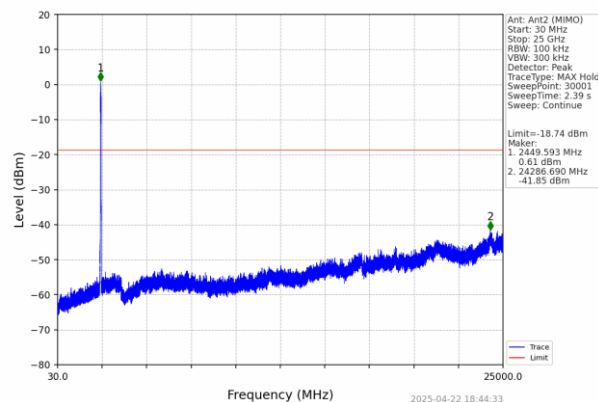
802.11n(HT40) MCH 2437MHz_Ant2 (MIMO) NTN



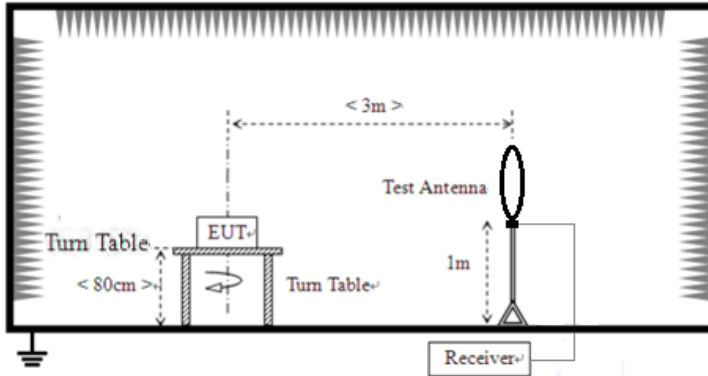
802.11n(HT40) HCH 2452MHz_Ant1 (MIMO) NTN

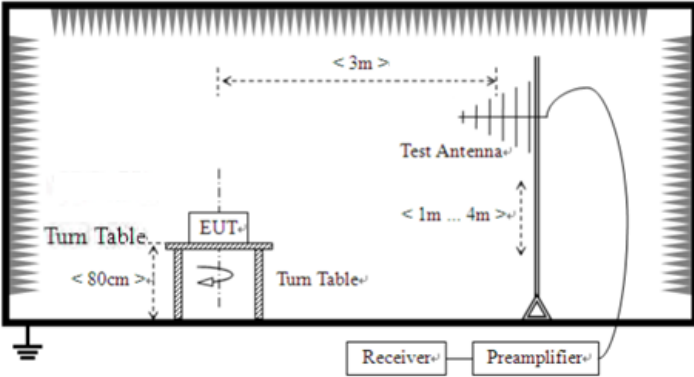
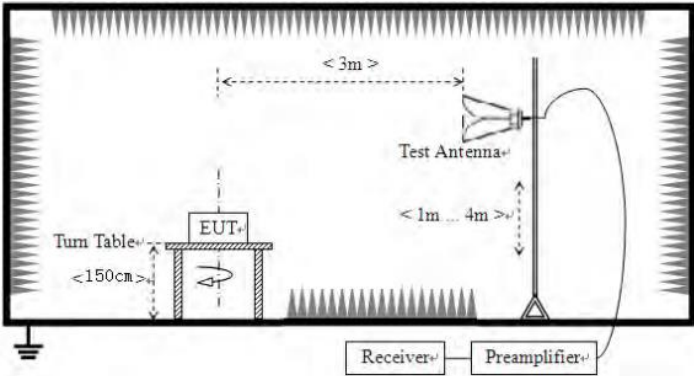
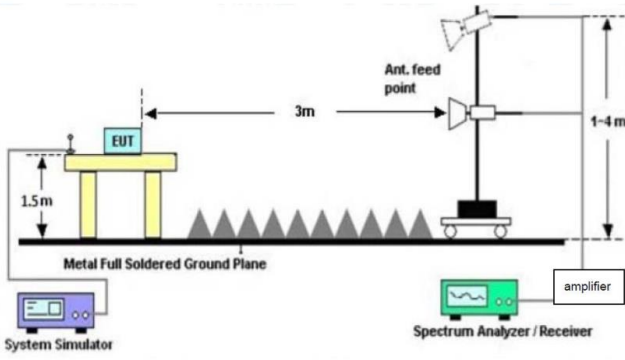


802.11n(HT40) HCH 2452MHz_Ant2 (MIMO) NTN



6.6.2. Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Limit (uV/m)	Value	Measurement Distance	
	0.009MHz-0.490MHz	2400/F(KHz)	QP	300m	
	0.490MHz-1.705MHz	24000/F(KHz)	QP	30m	
	1.705MHz-30MHz	30	QP	30m	
	30MHz-88MHz	100	QP	3m	
	88MHz-216MHz	150	QP		
	216MHz-960MHz	200	QP		
	960MHz-1GHz	500	QP		
	Above 1GHz	500	Average		
		5000	Peak		
Test setup:	For radiated emissions from 9kHz to 30MHz				
					

	For radiated emissions from 30MHz to 1GHz  For radiated emissions above 1GHz  
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the



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	maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

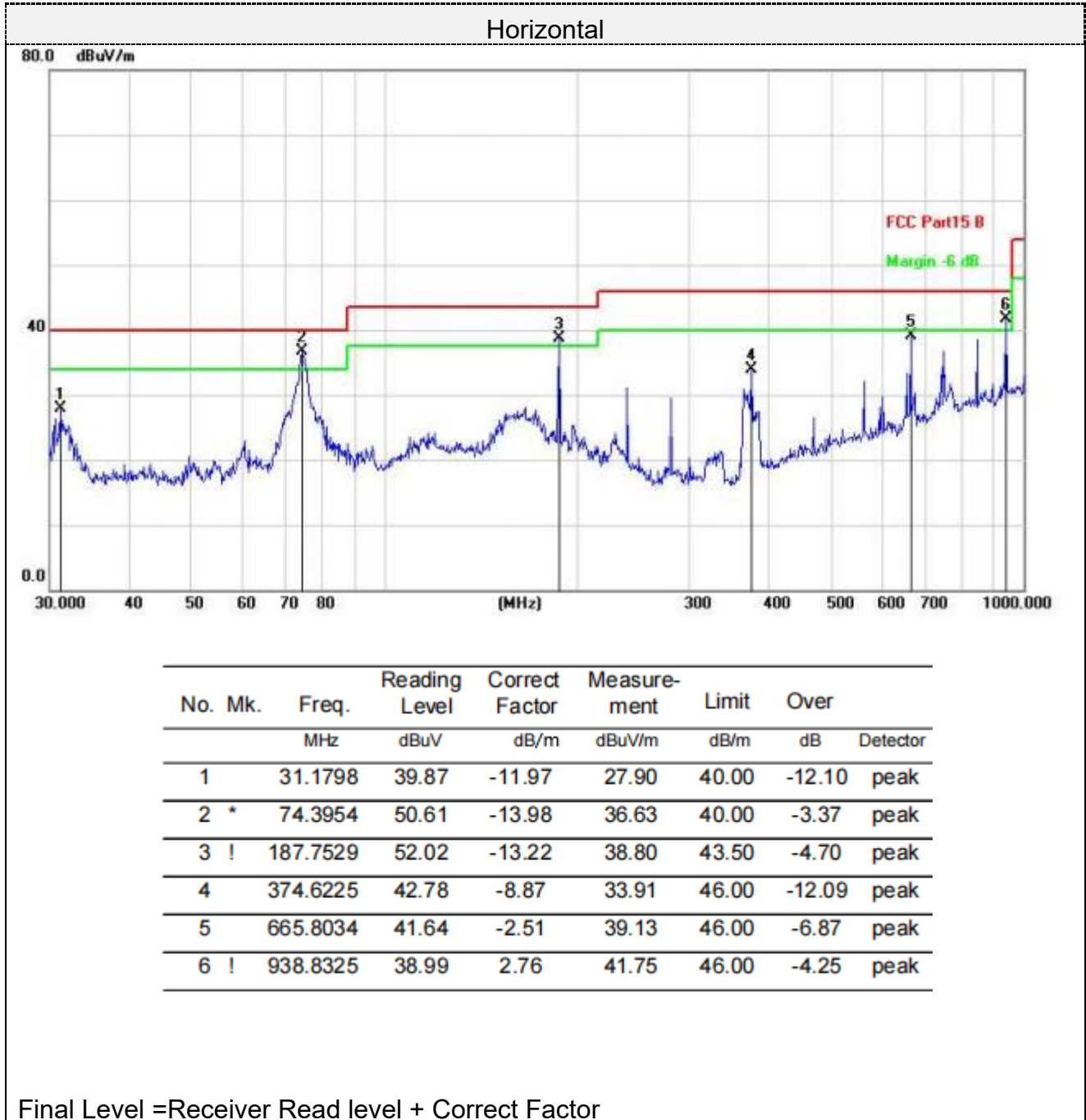
- 1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.*
- 2. All three channels (lowest/middle/highest) of each mode were measured below 1GHz and recorded worst case at 802.11n20 MIMO low channel.*
- 3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.*

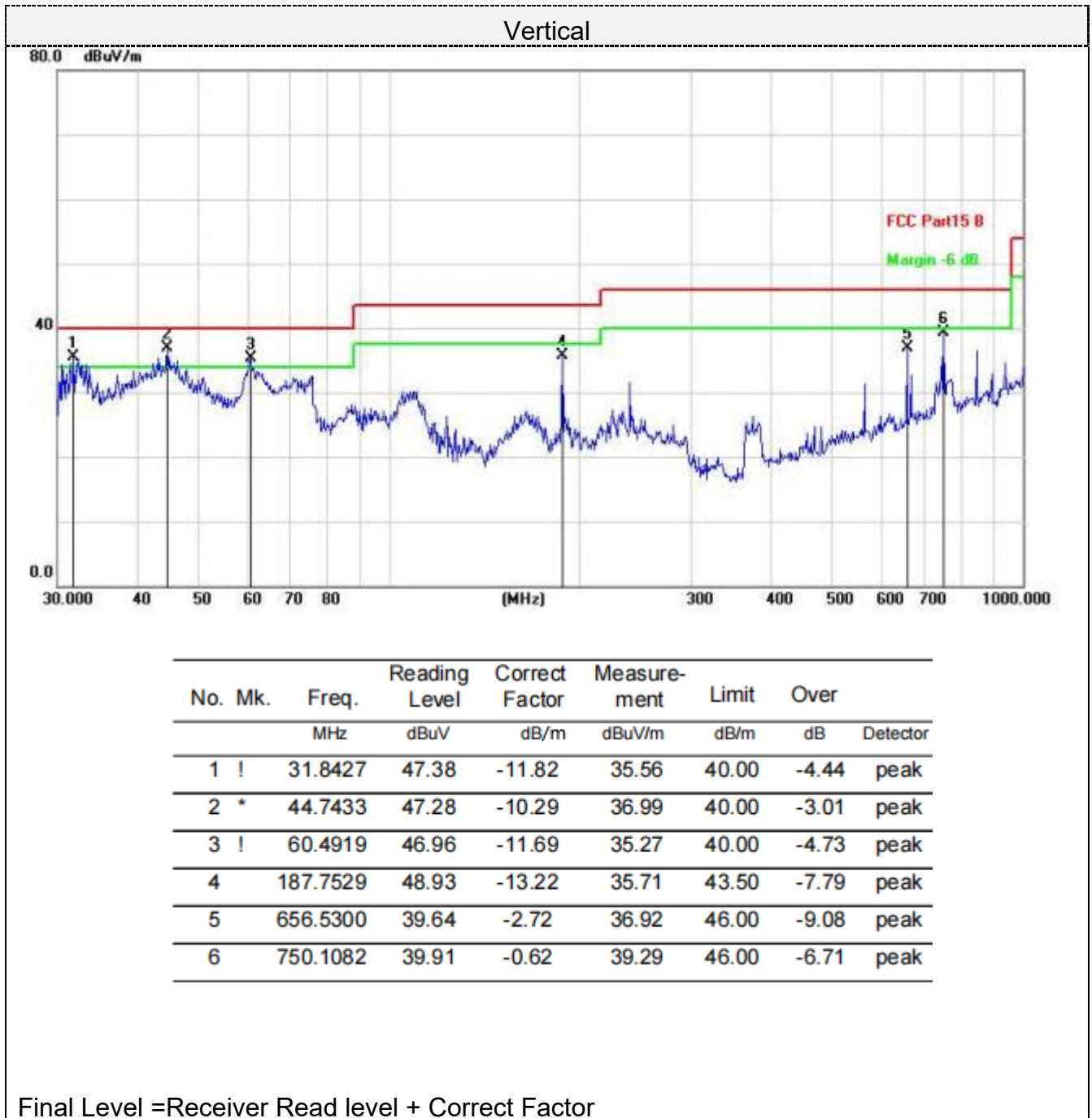
Measurement data:

■ **9kHz~30MHz**

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

Below 1GHz







■ Above 1-25GHz

Remark: During the test, pre-scan the 802.11b/802.11g/802.11n (H20)/802.11n (H40) modulation, and found the 802.11n20 MIMO modulation which it is worse case.

802.11n20MIMO:

Frequency(MHz):			2412		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4824.00	60.37	PK	74	13.63	54.55	31.05	6.52	31.75	5.82
4824.00	43.97	AV	54	10.03	38.15	31.05	6.52	31.75	5.82
7236.00	55.99	PK	74	18.01	43.18	36.08	8.18	31.45	12.81
7236.00	47.33	AV	54	6.67	34.52	36.08	8.18	31.45	12.81

Frequency(MHz):			2412		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4824.00	59.91	PK	74	14.09	54.09	31.05	6.52	31.75	5.82
4824.00	43.94	AV	54	10.06	38.12	31.05	6.52	31.75	5.82
7236.00	56.61	PK	74	17.39	43.80	36.08	8.18	31.45	12.81
7236.00	45.92	AV	54	8.08	33.11	36.08	8.18	31.45	12.81

Frequency(MHz):			2437		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4874.00	62.08	PK	74	11.92	55.64	31.25	6.7	31.51	6.44
4874.00	45.45	AV	54	8.55	39.01	31.25	6.7	31.51	6.44
7311.00	54.59	PK	74	19.41	41.45	36.25	8.31	31.42	13.14
7311.00	45.96	AV	54	8.04	32.82	36.25	8.31	31.42	13.14



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Frequency(MHz):			2437		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4874.00	61.48	PK	74	12.52	55.04	31.25	6.7	31.51	6.44
4874.00	45.22	AV	54	8.78	38.78	31.25	6.7	31.51	6.44
7311.00	56.08	PK	74	17.92	42.94	36.25	8.31	31.42	13.14
7311.00	46.62	AV	54	7.38	33.48	36.25	8.31	31.42	13.14

Frequency(MHz):			2462		Polarity:		HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4924.00	60.39	PK	74	13.61	53.52	31.52	6.8	31.45	6.87
4924.00	46.10	AV	54	7.90	39.23	31.52	6.8	31.45	6.87
7386.00	56.51	PK	74	17.49	42.95	36.51	8.4	31.35	13.56
7386.00	45.54	AV	54	8.46	31.98	36.51	8.4	31.35	13.56

Frequency(MHz):			2462		Polarity:		VERTICAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre- amplifier (dB)	Correction Factor (dB/m)
4924.00	61.89	PK	74	12.11	55.02	31.52	6.8	31.45	6.87
4924.00	44.20	AV	54	9.80	37.33	31.52	6.8	31.45	6.87
7386.00	57.18	PK	74	16.82	43.62	36.51	8.4	31.35	13.56
7386.00	46.44	AV	54	7.56	32.88	36.51	8.4	31.35	13.56

Remark:

(1) Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(2) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed.



6.7. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1) (I):

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Antenna Connected Construction

The maximum gain of antenna was 3.9 dBi for ANT 1 and 3.9 dBi for ANT 2.

Remark: The antenna gain is provided by the customer, if the data provided by the customer is not accurate, Shenzhen HTT Technology Co., Ltd. does not assume any responsibility.



7. Test Setup Photo

Reference to the **appendix I** for details.

8. EUT Constructional Details

Reference to the **appendix II** for details.

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