



TEST Report

Applicant: Shenzhen Speediance Living Technology Co., Ltd

Address of Applicant: 8A-F, Konka R&D Building, No.28, South 12th Road, Science and Technology Park, Nanshan District, Shenzhen, Guangdong Province, China

Manufacturer : Shenzhen Speediance Living Technology Co., Ltd

Address of Manufacturer : 8A-F, Konka R&D Building, No.28, South 12th Road, Science and Technology Park, Nanshan District, Shenzhen, Guangdong Province, China

Equipment Under Test (EUT)

Product Name: Interactive Multi-Media Digital Fitness Equipment

Model No.: GMB2100A1

Series model: GMB2100A2, GMB2100A3, GMB2100A4, GMB2100A5

Trade Mark: N/A

FCC ID: 2A4WP-GMB2100A1

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Date of sample receipt: Aug. 30, 2024

Date of Test: Aug. 30, 2024 ~ Nov. 14, 2024

Date of report issued: Nov. 14, 2024

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.



Report No.: HTT202408804F04

1. Version

Version No.	Date	Description
00	Nov. 14, 2024	Original

Tested/ Prepared By Heber He Date: Nov. 14, 2024
Project Engineer

Check By: Bruce Zhu Date: Nov. 14, 2024
Reviewer

Approved By : Kevin Yang Date: Nov. 14, 2024
Authorized Signature





2. Contents

Page

1. VERSION.....	2
2. CONTENTS	3
3. TEST SUMMARY	4
4. GENERAL INFORMATION.....	5
4.1. GENERAL DESCRIPTION OF EUT	5
4.2. TEST MODE	7
4.3. DESCRIPTION OF SUPPORT UNITS	7
4.4. DEVIATION FROM STANDARDS	7
4.5. ABNORMALITIES FROM STANDARD CONDITIONS.....	7
4.6. TEST FACILITY	7
4.7. TEST LOCATION	7
4.8. ADDITIONAL INSTRUCTIONS	7
5. TEST INSTRUMENTS LIST.....	7
6. TEST RESULTS AND MEASUREMENT DATA	9
6.1. CONDUCTED EMISSIONS	9
6.2. CONDUCTED PEAK OUTPUT POWER	12
6.3. CHANNEL BANDWIDTH.....	13
6.4. POWER SPECTRAL DENSITY	16
6.5. BAND EDGE	27
6.5.1. <i>Conducted Emission Method</i>	27
6.5.2. <i>Radiated Emission Method</i>	34
6.6. SPURIOUS EMISSION.....	36
6.6.1. <i>Conducted Emission Method</i>	36
6.6.2. <i>Radiated Emission Method</i>	53
6.7. ANTENNA REQUIREMENT	60
7. TEST SETUP PHOTO	61
8. EUT CONSTRUCTIONAL DETAILS	61



3. Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	FCC part 15.207	Pass
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass
6dB Bandwidth	FCC part 15.247 (a)(2)	Pass
Power Spectral Density	FCC part 15.247 (e)	Pass
Band Edge	FCC part 15.247(d)	Pass
Spurious Emission	FCC part 15.205/15.209	Pass

Remark: Test according to ANSI C63.10:2013 and RSS-Gen

Pass: The EUT complies with the essential requirements in the standard.

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.37 dB	(1)
Radiated Emission	1~18GHz	5.40 dB	(1)
Radiated Emission	18-40GHz	5.45 dB	(1)
Conducted Disturbance	0.15~30MHz	2.68 dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.



4. General Information

4.1. General Description of EUT

Product Name:	Interactive Multi-Media DigitalFitness Equipment
Model No.:	GMB2100A1
Series model:	GMB2100A2, GMB2100A3, GMB2100A4, GMB2100A5
Test sample(s) ID:	HTT202408804-1(Engineer sample) HTT202408804-2(Normal sample)
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11 802.11n(HT40):7
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(H20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	External Antenna
Antenna gain:	3.9 dBi for ANT 1 and 3.9 dBi for ANT 2
Power Supply:	AC 100-230V



Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)	
	802.11b/802.11g/802.11n(HT20)	802.11n(HT40)
Lowest channel	2412MHz	2422MHz
Middle channel	2437MHz	2437MHz
Highest channel	2462MHz	2452MHz



Report No.: HTT202408804F04

4.2. Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
<i>Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.</i>	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:				
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.				
Mode	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
Data rate	1Mbps	6Mbps	6.5Mbps	13Mbps

4.3. Description of Support Units

None.

4.4. Deviation from Standards

None.

4.5. Abnormalities from Standard Conditions

None.

4.6. Test Facility

The test facility is recognized, certified, or accredited by the following organizations: FCC-Registration No.: 779513 Designation Number: CN1319 Shenzhen HTT Technology Co.,Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. A2LA-Lab Cert. No.: 6435.01 Shenzhen HTT Technology Co.,Ltd. has been accredited by American Association for Laboratory Accreditation to perform electromagnetic emission measurement. The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.
--

4.7. Test Location

All tests were performed at:
Shenzhen HTT Technology Co.,Ltd. 1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-23595200 Fax: 0755-23595201

4.8. Additional Instructions

Test Software	Special AT test command provided by manufacturer to Keep the EUT in continuously transmitting mode and hopping mode
Power level setup	Default

5. Test Instruments list

Item	Test Equipment	Manufacturer	Model No.	Inventory	Cal.Date	Cal.Due date
------	----------------	--------------	-----------	-----------	----------	--------------

Shenzhen HTT Technology Co.,Ltd. Tel: 0755-23595200 Fax: 0755-23595201
1F, Building B, Huafeng International Robotics Industrial Park, Hangcheng Road,Nanchang Community, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China

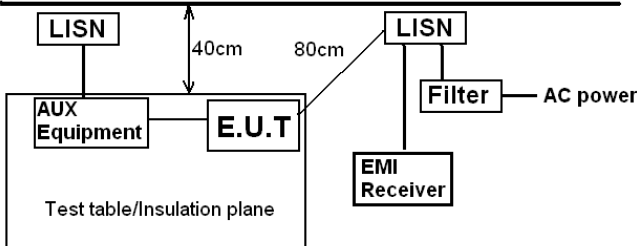


Report No.: HTT202408804F04

				No.	(mm-dd-yy)	(mm-dd-yy)
1	3m Semi- Anechoic Chamber	Shenzhen C.R.T technology co., LTD	9*6*6	HTT-E028	Aug. 10 2024	Aug. 09 2027
2	Control Room	Shenzhen C.R.T technology co., LTD	4.8*3.5*3.0	HTT-E030	Aug. 10 2024	Aug. 09 2027
3	EMI Test Receiver	Rohde&Schwar	ESCI7	HTT-E022	Apr. 26 2024	Apr. 25 2025
4	Spectrum Analyzer	Rohde&Schwar	FSP	HTT-E037	Apr. 26 2024	Apr. 25 2025
5	Coaxial Cable	ZDecl	ZT26-NJ-NJ-0.6M	HTT-E018	Apr. 26 2024	Apr. 25 2025
6	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-2M	HTT-E019	Apr. 26 2024	Apr. 25 2025
7	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-0.6M	HTT-E020	Apr. 26 2024	Apr. 25 2025
8	Coaxial Cable	ZDecl	ZT26-NJ-SMAJ-8.5M	HTT-E021	Apr. 26 2024	Apr. 25 2025
9	Composite logarithmic antenna	Schwarzbeck	VULB 9168	HTT-E017	May. 21 2024	May. 20 2025
10	Horn Antenna	Schwarzbeck	BBHA9120D	HTT-E016	May. 20 2024	May. 19 2025
11	Loop Antenna	Zhinan	ZN30900C	HTT-E039	Apr. 26 2024	Apr. 25 2025
12	Horn Antenna	Beijing Hangwei Dayang	OBH100400	HTT-E040	Apr. 26 2024	Apr. 25 2025
13	low frequency Amplifier	Sonoma Instrument	310	HTT-E015	Apr. 26 2024	Apr. 25 2025
14	high-frequency Amplifier	HP	8449B	HTT-E014	Apr. 26 2024	Apr. 25 2025
15	Variable frequency power supply	Shenzhen Anbiao Instrument Co., Ltd	ANB-10VA	HTT-082	Apr. 26 2024	Apr. 25 2025
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	HTT-E004	Apr. 26 2024	Apr. 25 2025
17	Artificial Mains	Rohde & Schwarz	ESH3-Z5	HTT-E006	May. 23 2024	May. 22 2025
18	Artificial Mains	Rohde & Schwarz	ENV-216	HTT-E038	May. 23 2024	May. 22 2025
19	Cable Line	Robinson	Z302S-NJ-BNCJ-1.5M	HTT-E001	Apr. 26 2024	Apr. 25 2025
20	Attenuator	Robinson	6810.17A	HTT-E007	Apr. 26 2024	Apr. 25 2025
21	Variable frequency power supply	Shenzhen Yanghong Electric Co., Ltd	YF-650 (5KVA)	HTT-E032	Apr. 26 2024	Apr. 25 2025
22	Control Room	Shenzhen C.R.T technology co., LTD	8*4*3.5	HTT-E029	Aug. 10 2024	Aug. 09 2027
23	DC power supply	Agilent	E3632A	HTT-E023	Apr. 26 2024	Apr. 25 2025
24	EMI Test Receiver	Agilent	N9020A	HTT-E024	Apr. 26 2024	Apr. 25 2025
25	Analog signal generator	Agilent	N5181A	HTT-E025	Apr. 26 2024	Apr. 25 2025
26	Vector signal generator	Agilent	N5182A	HTT-E026	Apr. 26 2024	Apr. 25 2025
27	Power sensor	Keysight	U2021XA	HTT-E027	Apr. 26 2024	Apr. 25 2025
28	Temperature and humidity meter	Shenzhen Anbiao Instrument Co., Ltd	TH10R	HTT-074	Apr. 28 2024	Apr. 27 2025
29	Radiated Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
30	Conducted Emission Test Software	Farad	EZ-EMC	N/A	N/A	N/A
31	RF Test Software	panshanrf	TST	N/A	N/A	N/A

6. Test results and Measurement Data

6.1. Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Test Frequency Range:	150KHz to 30MHz						
Class / Severity:	Class B						
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto						
Limit:	Frequency range (MHz)		Limit (dBuV)				
			Quasi-peak		Average		
	0.15-0.5		66 to 56*		56 to 46*		
	0.5-5		56		46		
	5-30		60		50		
* Decreases with the logarithm of the frequency.							
Test setup:	Reference Plane  Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m						
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.						
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						

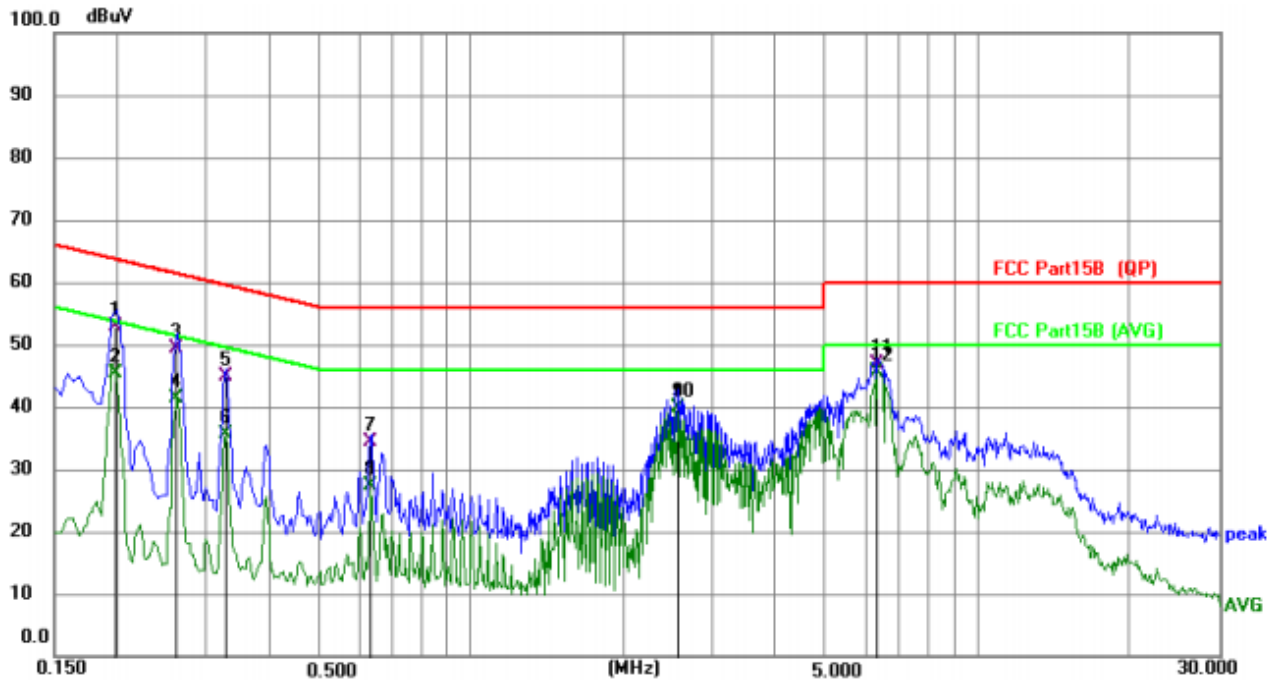
Remark: Both high and low voltages have been tested to show only the worst low voltage test data.



Report No.: HTT202408804F04

Measurement data:

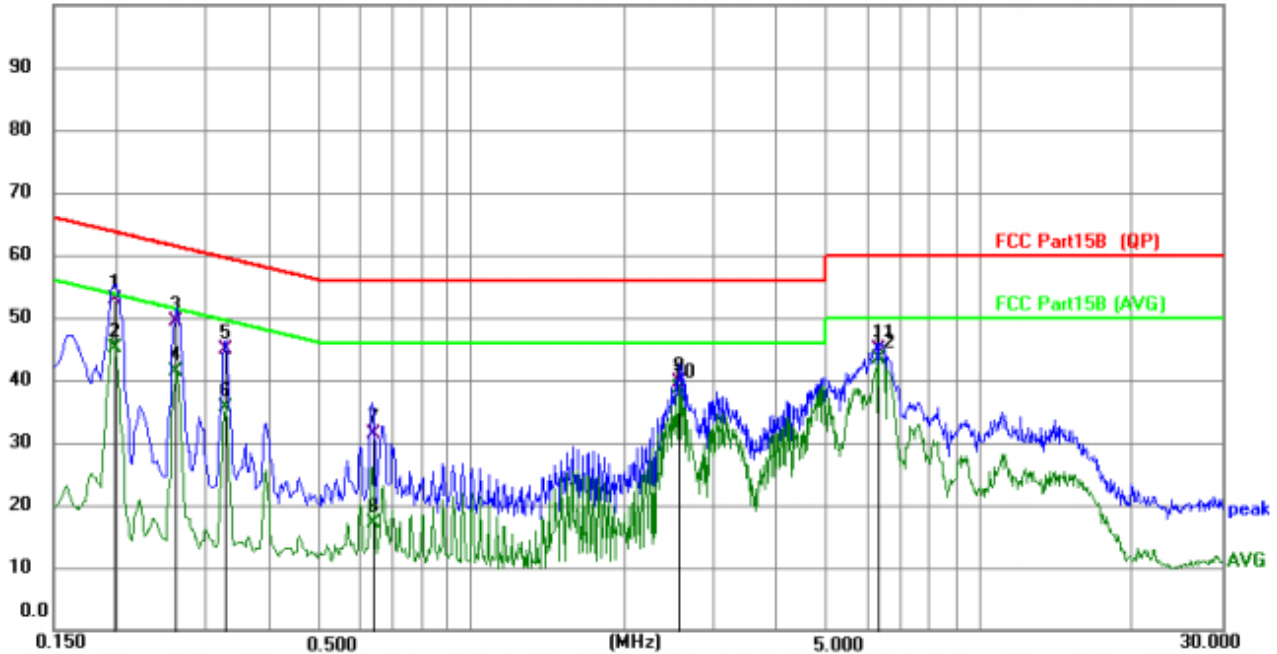
Line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1982	42.73	10.21	52.94	63.69	-10.75	QP
2		0.1982	35.26	10.21	45.47	53.69	-8.22	AVG
3		0.2621	39.24	10.23	49.47	61.36	-11.89	QP
4		0.2621	31.08	10.23	41.31	51.36	-10.05	AVG
5		0.3270	34.61	10.24	44.85	59.53	-14.68	QP
6		0.3270	25.44	10.24	35.68	49.53	-13.85	AVG
7		0.6344	23.94	10.32	34.26	56.00	-21.74	QP
8		0.6344	17.05	10.32	27.37	46.00	-18.63	AVG
9		2.5620	29.35	10.46	39.81	56.00	-16.19	QP
10		2.5620	29.51	10.46	39.97	46.00	-6.03	AVG
11		6.3199	36.15	10.62	46.77	60.00	-13.23	QP
12	*	6.3199	34.97	10.62	45.59	50.00	-4.41	AVG

Neutral:

100.0 dBuV



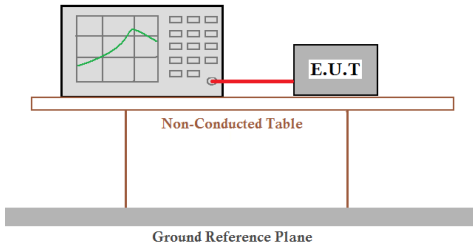
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1983	42.59	10.21	52.80	63.68	-10.88	QP
2		0.1983	34.99	10.21	45.20	53.68	-8.48	AVG
3		0.2615	39.26	10.23	49.49	61.38	-11.89	QP
4		0.2615	31.24	10.23	41.47	51.38	-9.91	AVG
5		0.3271	34.56	10.24	44.80	59.52	-14.72	QP
6		0.3271	25.30	10.24	35.54	49.52	-13.98	AVG
7		0.6424	21.15	10.32	31.47	56.00	-24.53	QP
8		0.6424	6.89	10.32	17.21	46.00	-28.79	AVG
9		2.5620	29.07	10.46	39.53	56.00	-16.47	QP
10		2.5620	28.09	10.46	38.55	46.00	-7.45	AVG
11		6.3199	34.30	10.62	44.92	60.00	-15.08	QP
12	*	6.3199	32.86	10.62	43.48	50.00	-6.52	AVG

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 Los



6.2. Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)					
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02					
Limit:	30dBm					
Test setup:	Power sensor and Spectrum analyzer  Non-Conducted Table 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

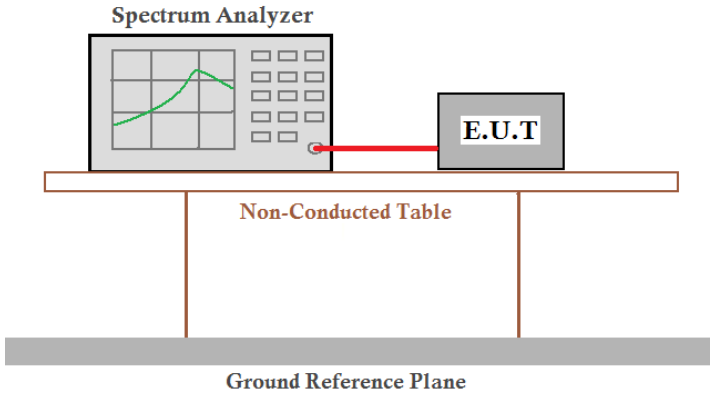
Measurement Data

Mode	TX Type	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)				Verdict
			ANT1	ANT2	MIMO	Limit	
802.11b	SISO	2412	13.05	11.11	/	<=30	Pass
		2437	12.15	11.41	/	<=30	Pass
		2462	9.12	10.63	/	<=30	Pass
802.11g	SISO	2412	17.6	15.99	/	<=30	Pass
		2437	16.84	16.51	/	<=30	Pass
		2462	14.22	15.86	/	<=30	Pass
802.11n (HT20)	MIMO	2412	14.04	14.5	17.29	<=29.08	Pass
		2437	15.38	14.97	18.19	<=29.08	Pass
		2462	13.74	14.38	17.08	<=29.08	Pass
802.11n (HT40)	MIMO	2422	11.65	10.41	14.08	<=29.08	Pass
		2437	13.71	13.54	16.64	<=29.08	Pass
		2452	12.41	12.49	15.46	<=29.08	Pass

Note:

- 1) Measured output power at difference data rate for each mode and recorded worst case for each mode.
- 2) Test results including cable loss.
- 3) Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20; 13Mbps at IEEE 802.11n HT40

6.3. Channel Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)					
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02					
Limit:	>500KHz					
Test setup:						
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

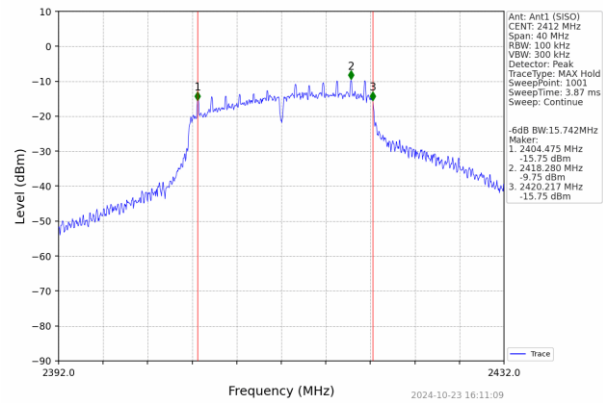
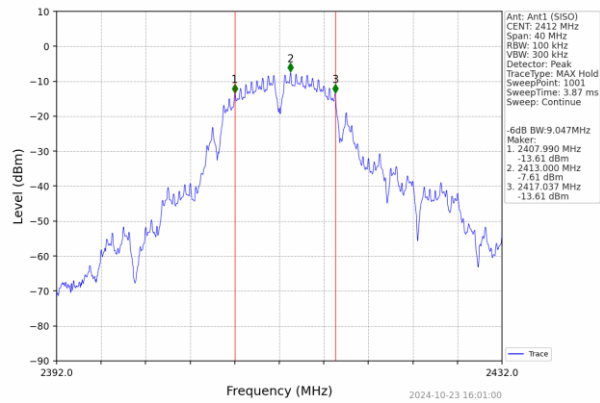
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	9.047	≥ 0.5	Pass
		2437	1	8.613	≥ 0.5	Pass
		2462	1	8.636	≥ 0.5	Pass
802.11g	SISO	2412	1	15.742	≥ 0.5	Pass
		2437	1	15.762	≥ 0.5	Pass
		2462	1	15.782	≥ 0.5	Pass
802.11n (HT20)	MIMO	2412	1	16.176	≥ 0.5	Pass
		2437	1	16.333	≥ 0.5	Pass
		2462	1	16.376	≥ 0.5	Pass
802.11n (HT40)	MIMO	2422	1	21.348	≥ 0.5	Pass
		2437	1	25.126	≥ 0.5	Pass
		2452	1	35.599	≥ 0.5	Pass



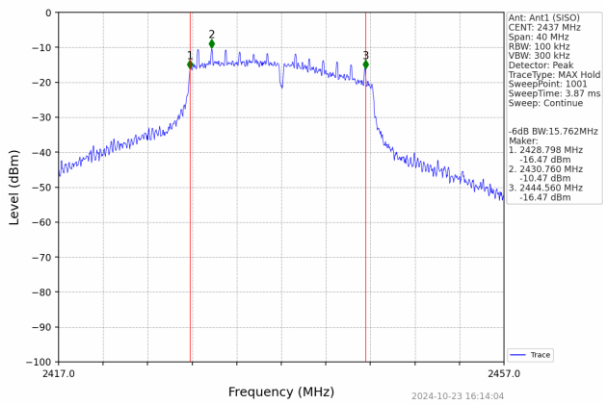
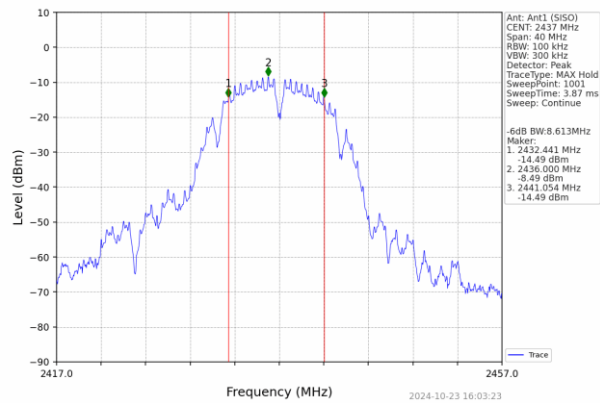
Report No.: HTT202408804F04

Test plot as follows:

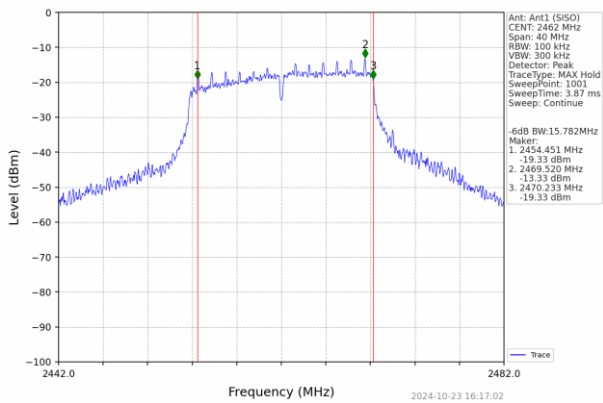
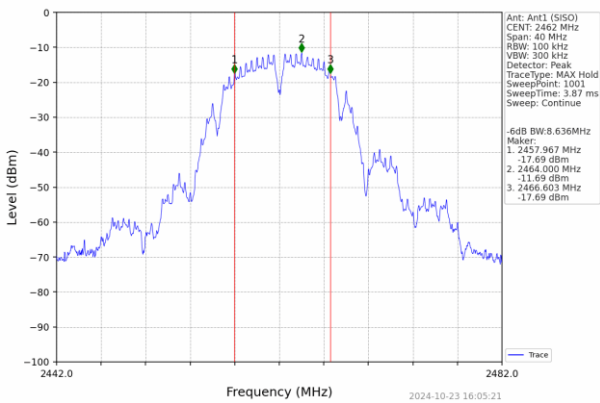
802.11b	802.11g
---------	---------



Lowest channel



Middle channel

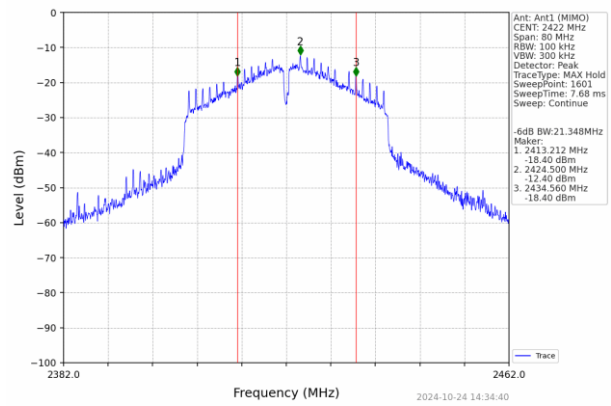
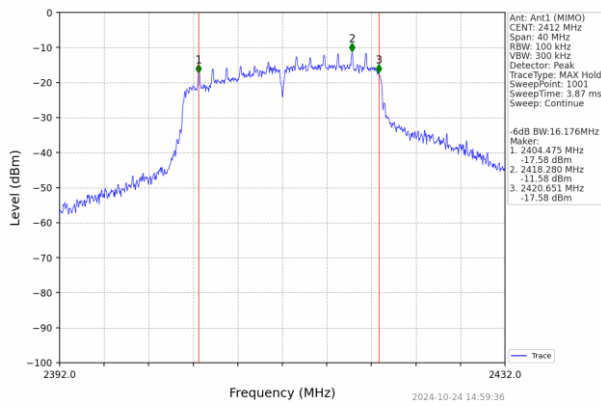


Highest channel

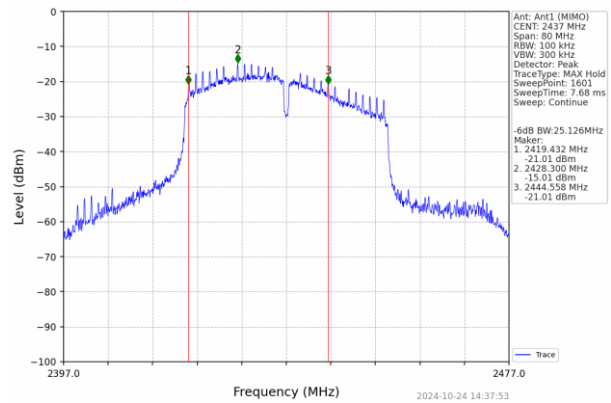
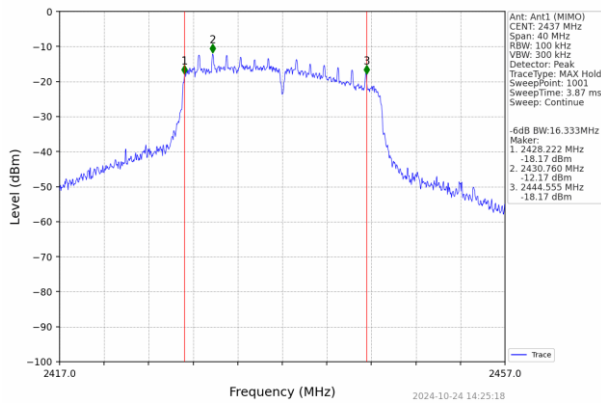


Report No.: HTT202408804F04

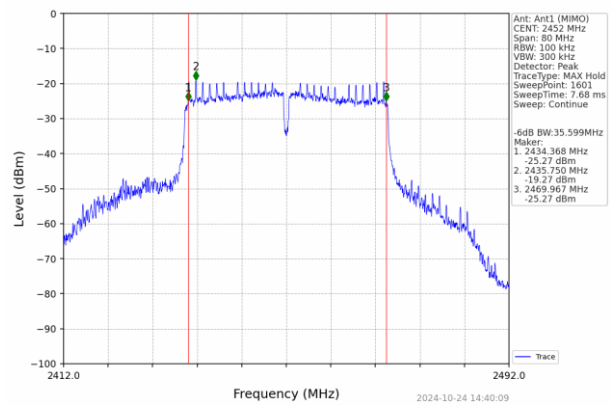
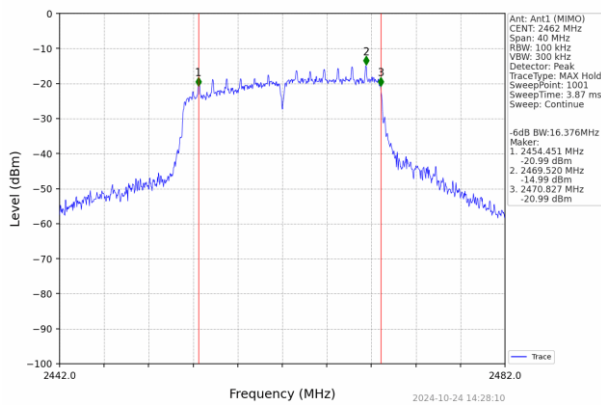
802.11n(HT20)	802.11n(HT40)
---------------	---------------



Lowest channel

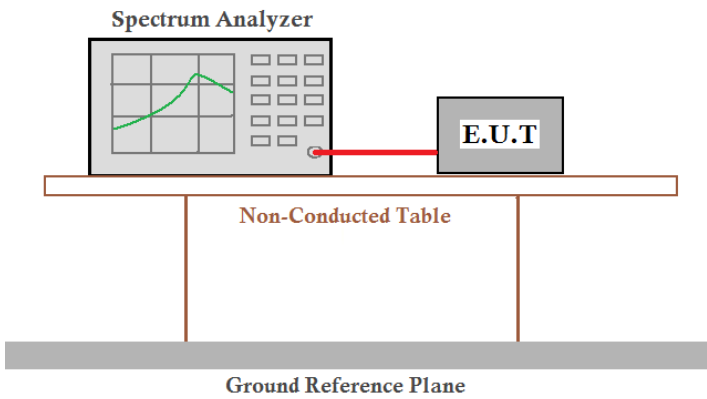


Middle channel



Highest channel

6.4. Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)					
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02					
Limit:	8dBm/3kHz					
Test setup:						
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

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)				Verdict
			ANT1	ANT2	MIMO	Limit	
802.11b	SISO	2412	-21.29	-23.62	/	<=8	Pass
		2437	-23.56	-23.87	/	<=8	Pass
		2462	-25.13	-25.23	/	<=8	Pass
802.11g	SISO	2412	-25.20	-25.97	/	<=8	Pass
		2437	-26.14	-26.76	/	<=8	Pass
		2462	-28.62	-26.97	/	<=8	Pass
802.11n (HT20)	MIMO	2412	-27.16	-27.69	-24.85	<=7.08	Pass
		2437	-27.05	-26.75	-24.52	<=7.08	Pass
		2462	-30.66	-26.91	-25.87	<=7.08	Pass
802.11n (HT40)	MIMO	2422	-26.31	-30.63	-25.57	<=7.08	Pass
		2437	-29.51	-27.35	-26.62	<=7.08	Pass
		2452	-33.33	-26.11	-25.35	<=7.08	Pass

Note:

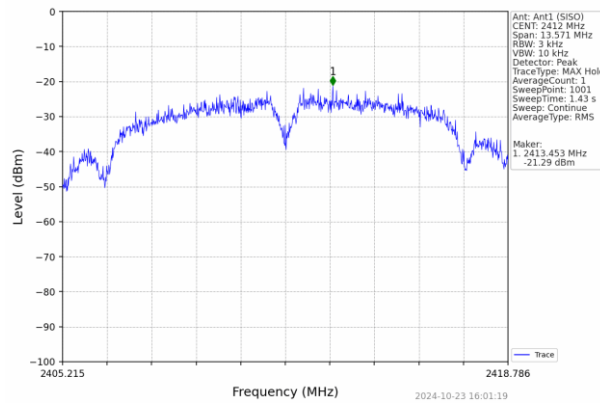
- 1) Measured peak power spectrum density at difference data rate for each mode and recorded worst case for each mode.
- 2) Test results including cable loss;
- 3) Worst case data at 1Mbps at IEEE 802.11b; 6Mbps at IEEE 802.11g; 6.5Mbps at IEEE 802.11n HT20;13Mbps at IEEE 802.11n HT40



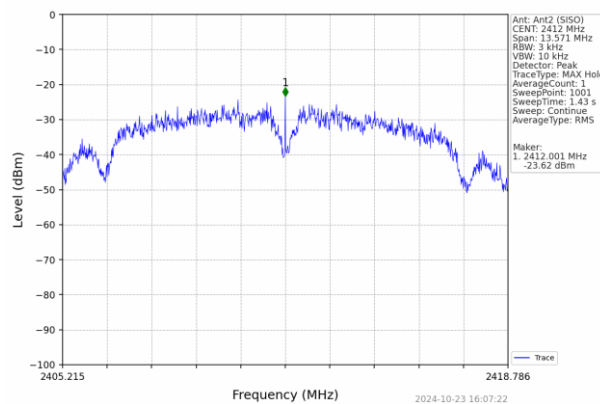
Report No.: HTT202408804F04

Test plot as follows:

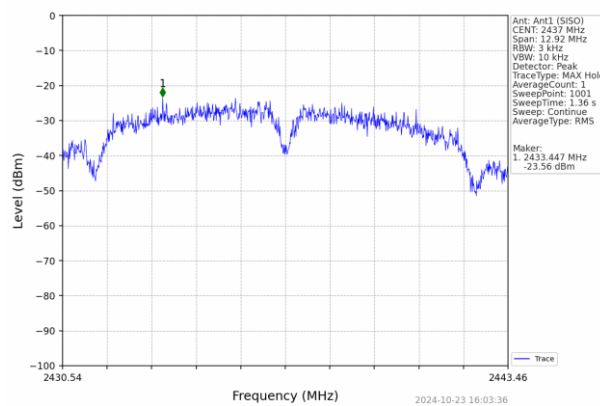
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_LCH_2412MHz_Ant2 (SISO)_NTNV



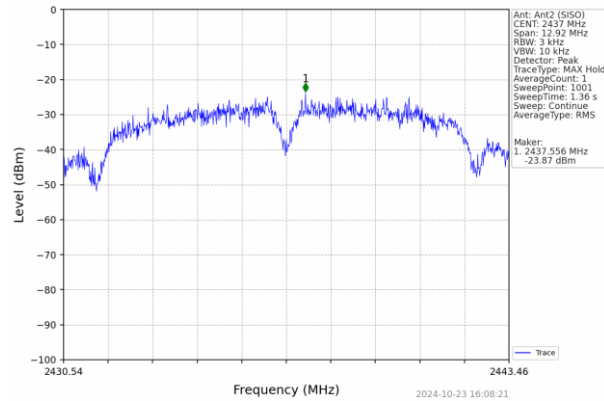
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



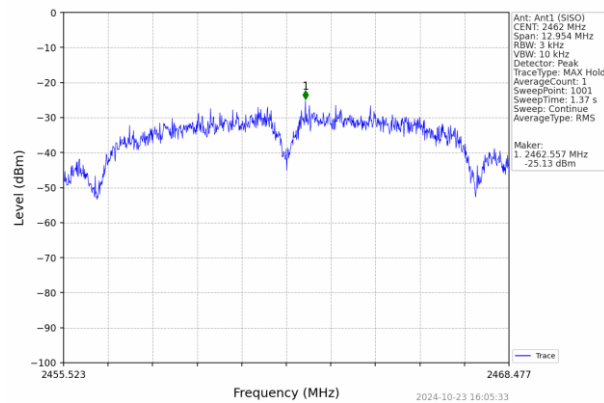


Report No.: HTT202408804F04

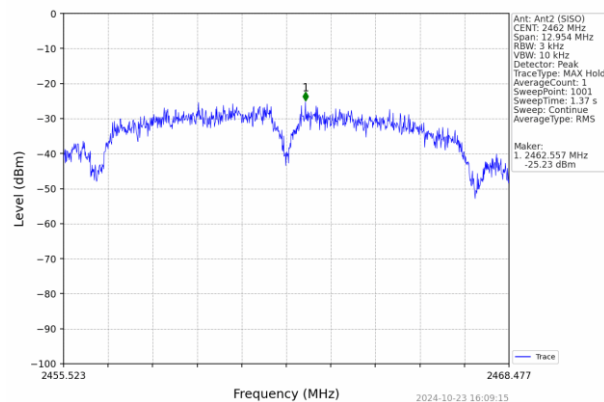
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



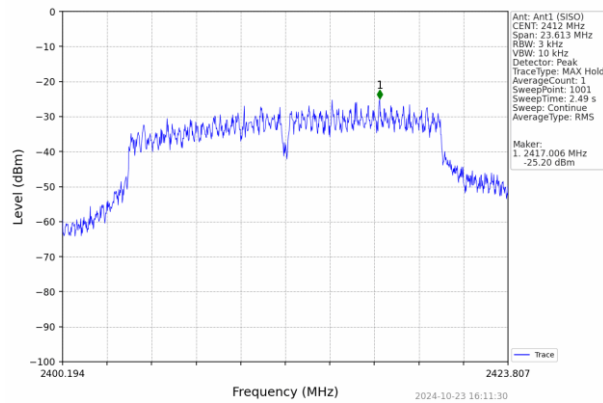
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



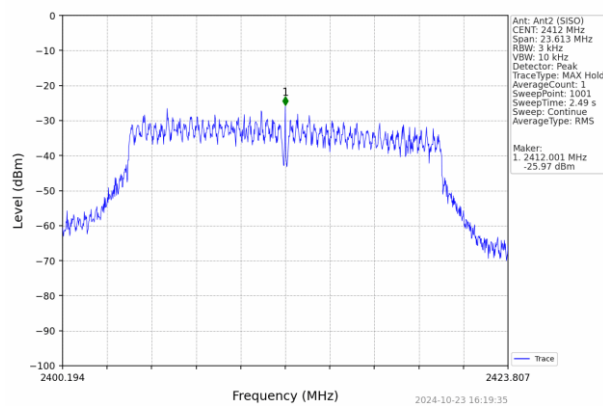


Report No.: HTT202408804F04

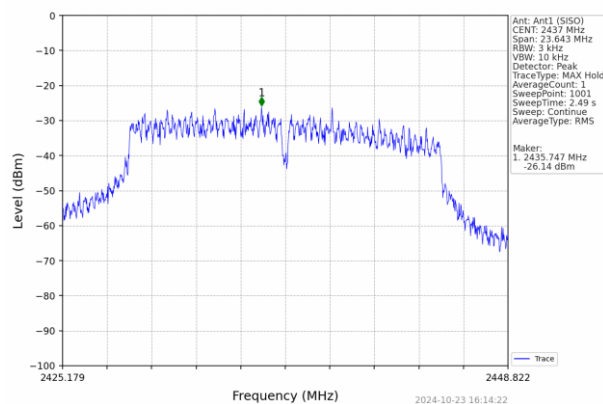
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



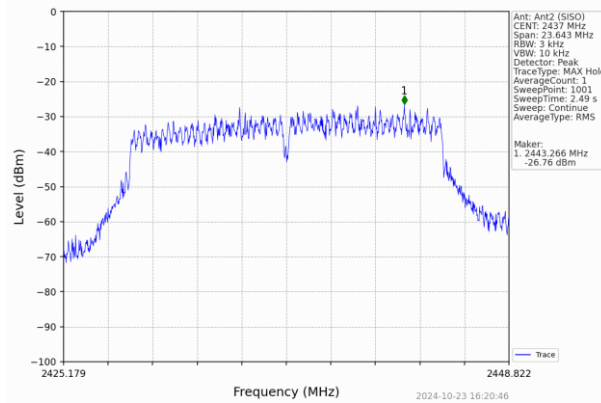
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



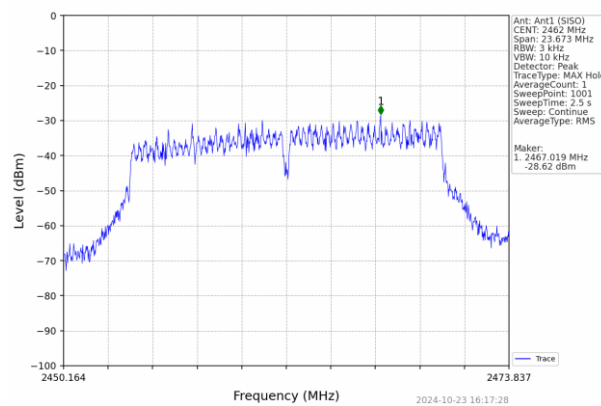


Report No.: HTT202408804F04

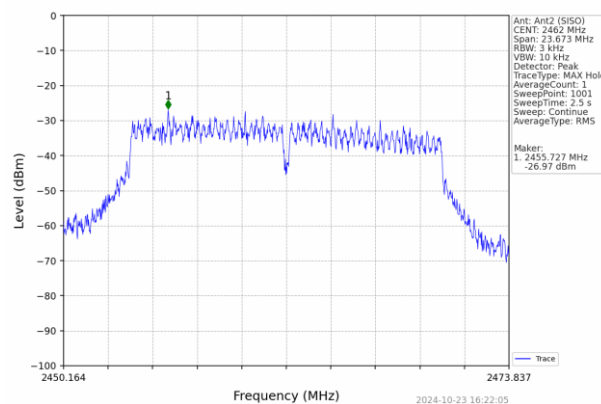
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



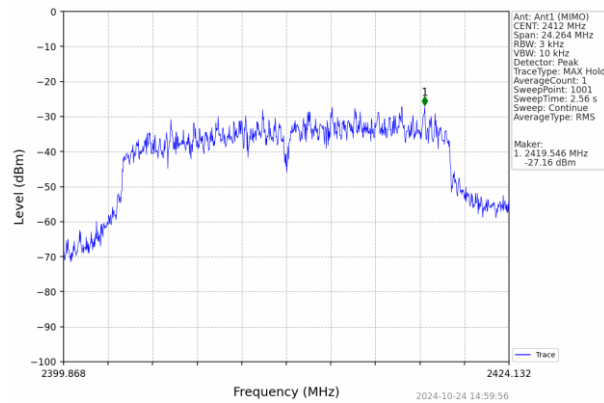
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



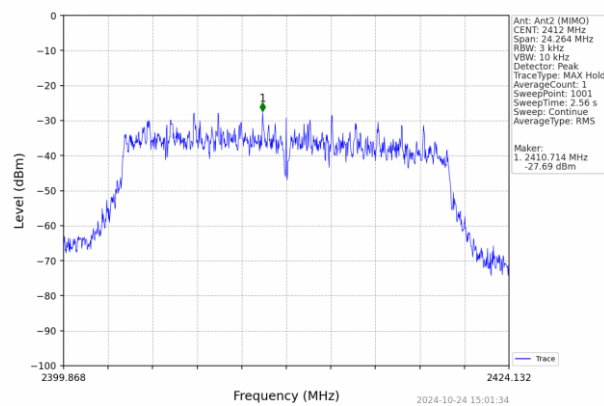


Report No.: HTT202408804F04

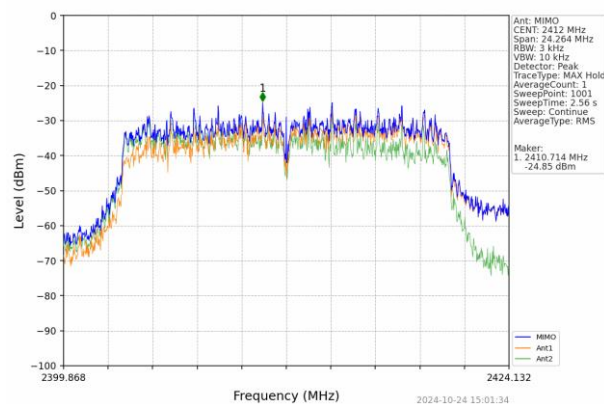
802.11n(HT20)_LCH_2412MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant2 (MIMO)_NTNV



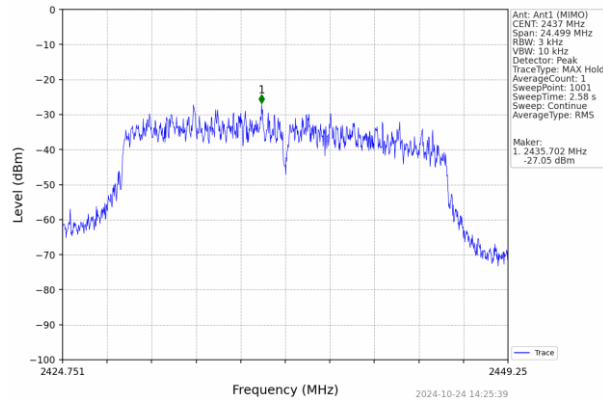
802.11n(HT20)_LCH_2412MHz_MIMO_NTNV



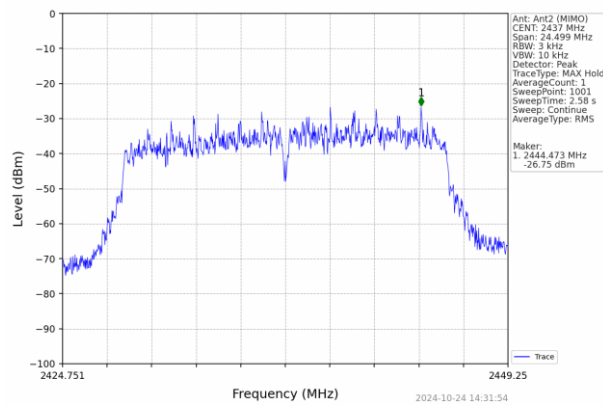


Report No.: HTT202408804F04

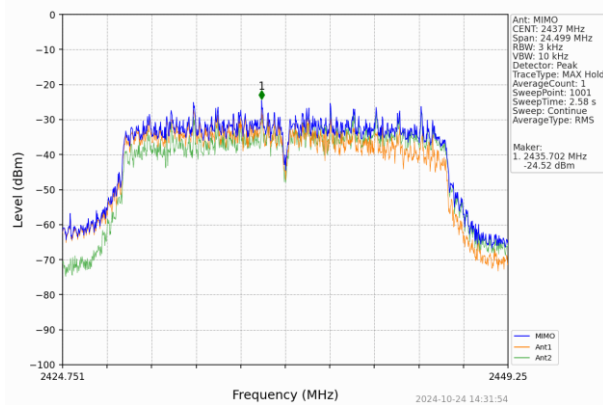
802.11n(HT20)_MCH_2437MHz_Ant1 (MIMO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant2 (MIMO)_NTNV



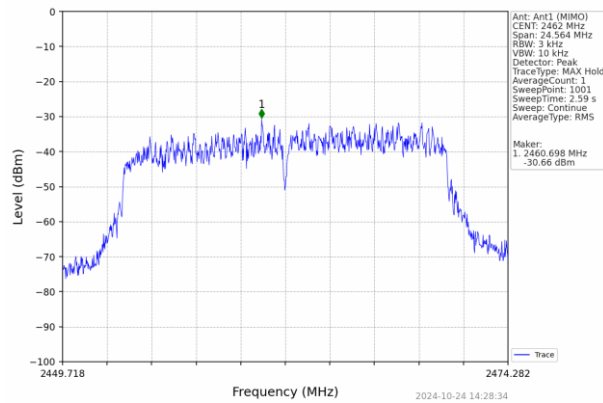
802.11n(HT20)_MCH_2437MHz_MIMO_NTNV



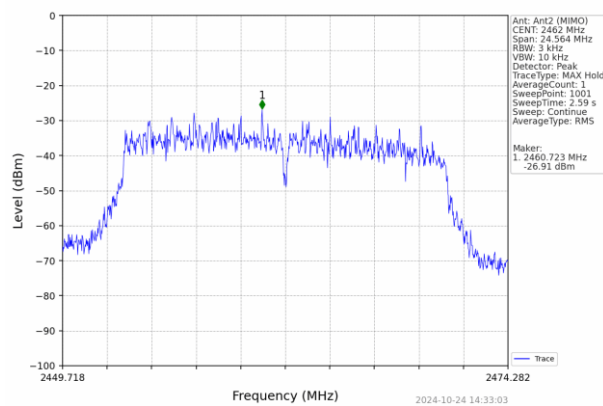


Report No.: HTT202408804F04

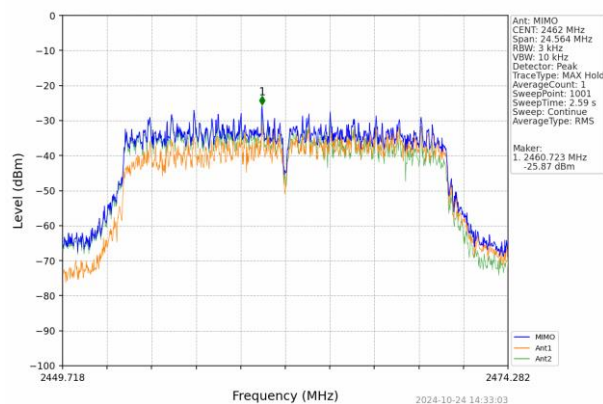
802.11n(HT20) HCH_2462MHz_Ant1 (MIMO) NTN



802.11n(HT20) HCH_2462MHz_Ant2 (MIMO) NTN



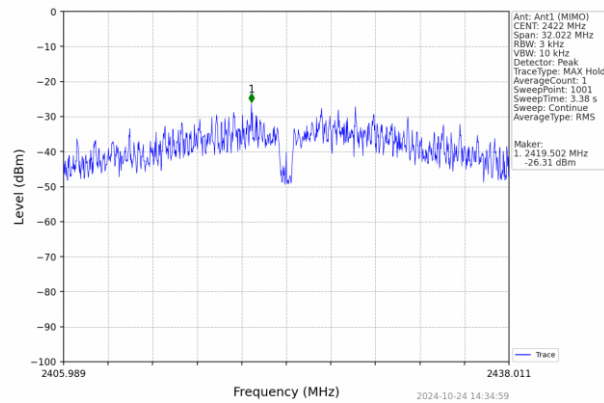
802.11n(HT20) HCH_2462MHz_MIMO NTN



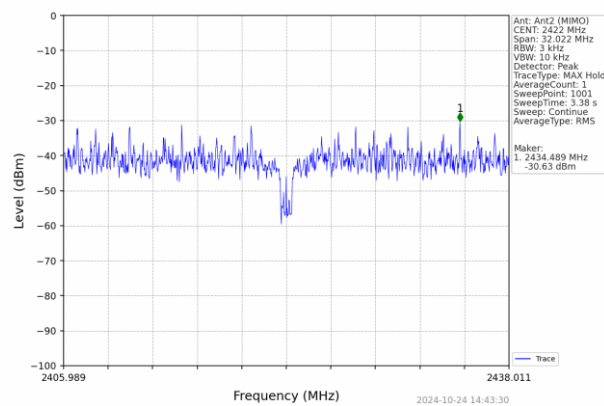


Report No.: HTT202408804F04

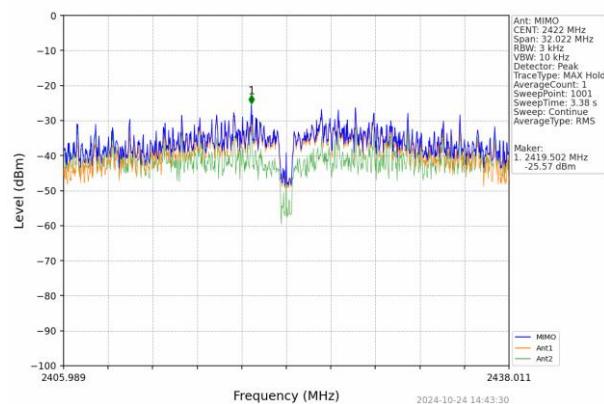
802.11n(HT40)_LCH_2422MHz_Ant1 (MIMO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant2 (MIMO)_NTNV



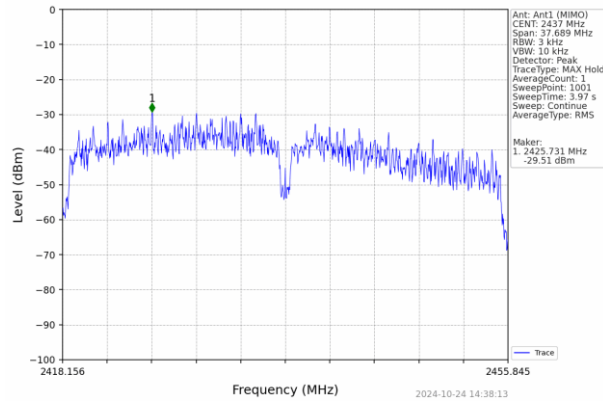
802.11n(HT40)_LCH_2422MHz_MIMO_NTNV



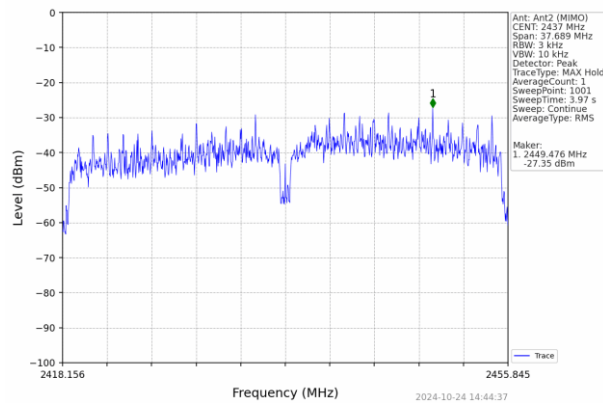


Report No.: HTT202408804F04

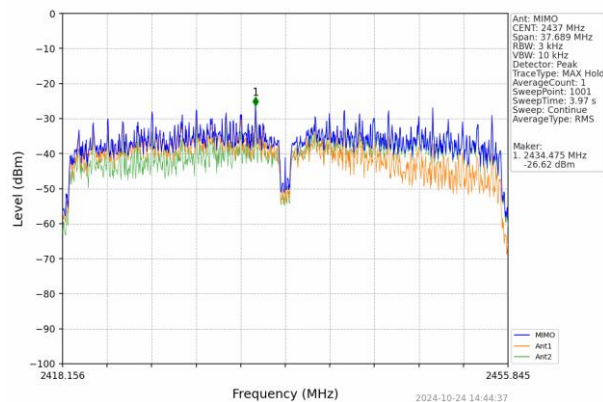
802.11n(HT40) MCH_2437MHz_Ant1 (MIMO) NTN



802.11n(HT40) MCH_2437MHz_Ant2 (MIMO) NTN



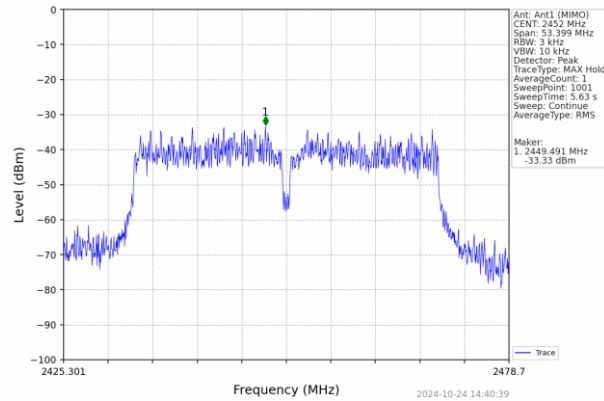
802.11n(HT40) MCH_2437MHz MIMO NTN



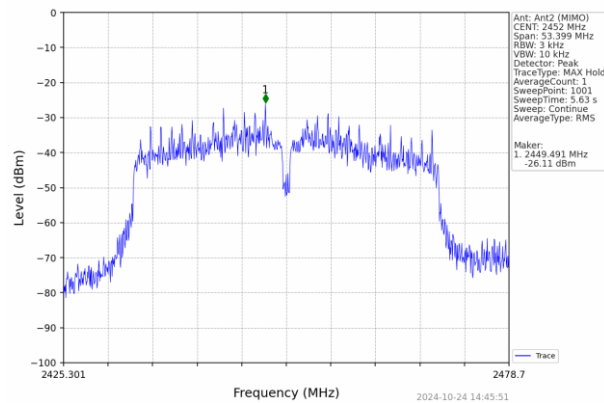


Report No.: HTT202408804F04

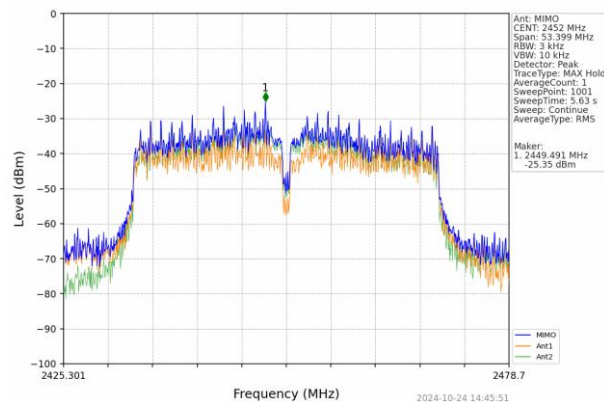
802.11n(HT40) HCH 2452MHz_Ant1 (MIMO) NTN



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

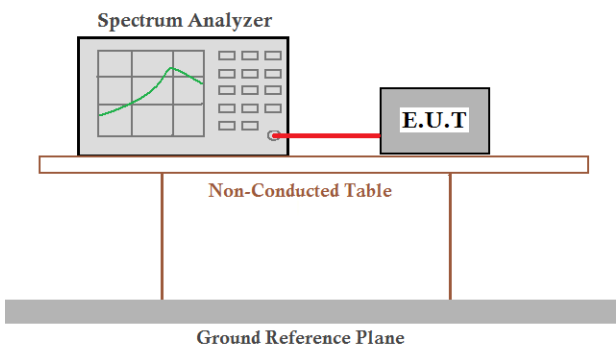


802.11n(HT40) HCH 2452MHz MIMO NTN



6.5. Band Edge

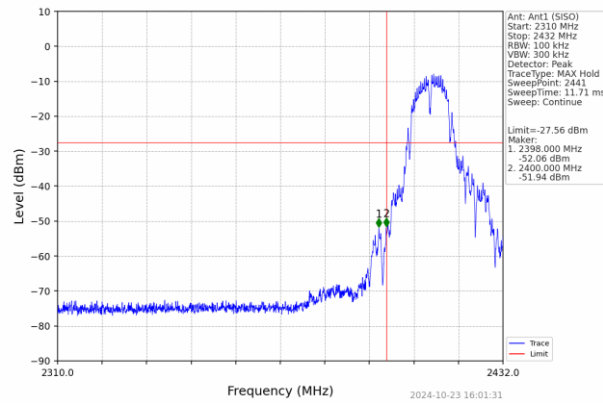
6.5.1. Conducted Emission Method

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 to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table 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

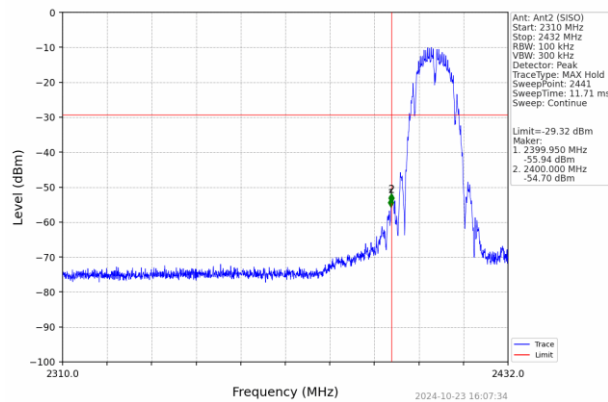


Test plot as follows:

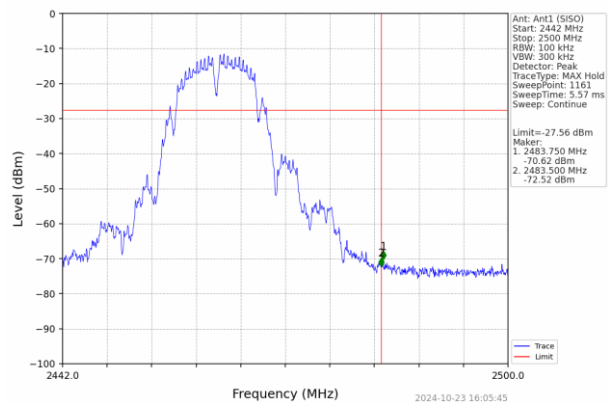
802.11b LCH 2412MHz_Ant1 (SISO) NTN



802.11b LCH 2412MHz_Ant2 (SISO) NTN



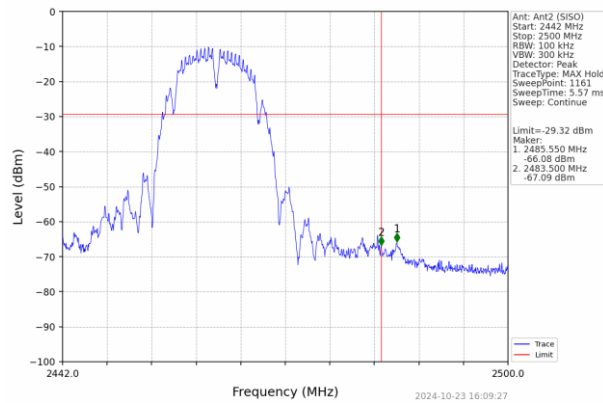
802.11b HCH 2462MHz_Ant1 (SISO) NTN



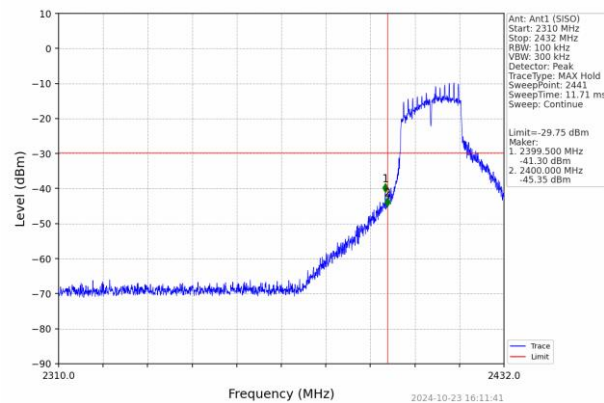


Report No.: HTT202408804F04

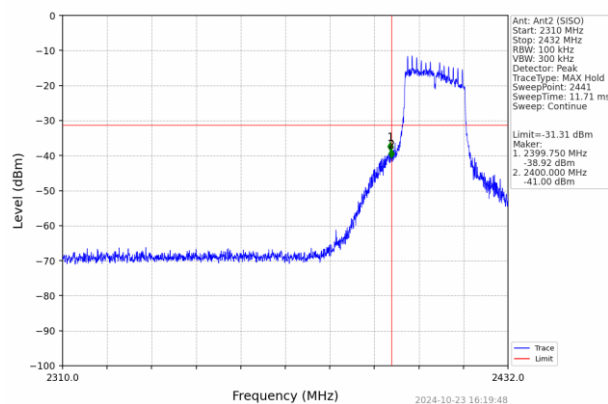
802.11b HCH 2462MHz Ant2 (SISO) NTN



802.11g LCH 2412MHz Ant1 (SISO) NTN



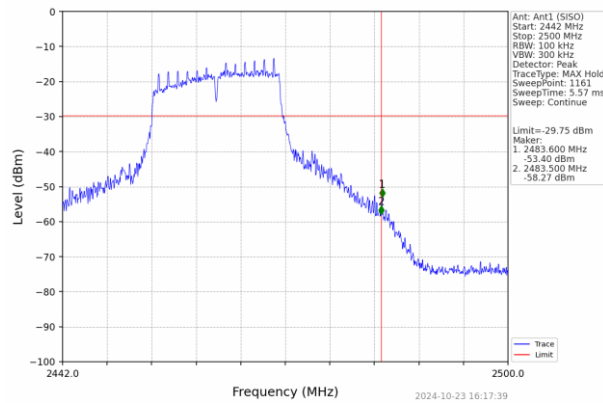
802.11g LCH 2412MHz Ant2 (SISO) NTN



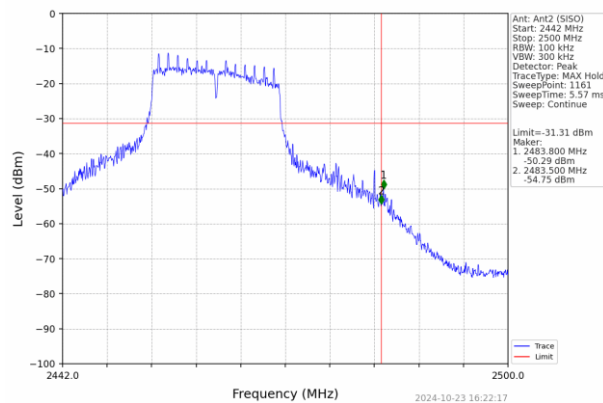


Report No.: HTT202408804F04

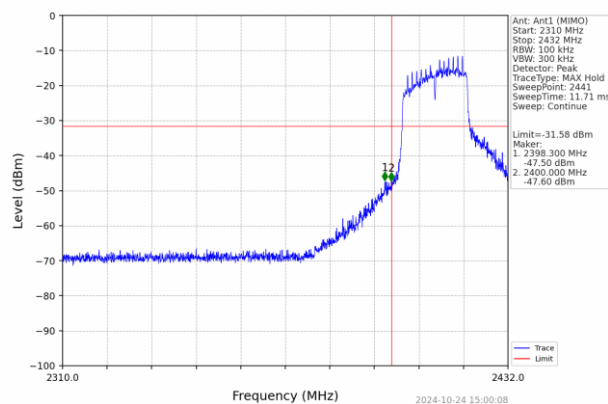
802.11g HCH 2462MHz Ant1 (SISO) NTN



802.11g HCH 2462MHz Ant2 (SISO) NTN



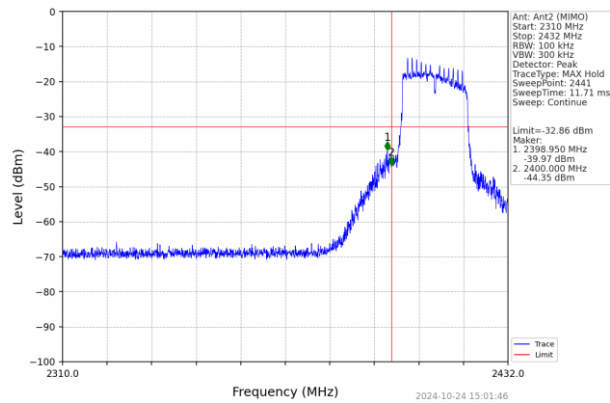
802.11n(HT20) LCH 2412MHz Ant1 (MIMO) NTN



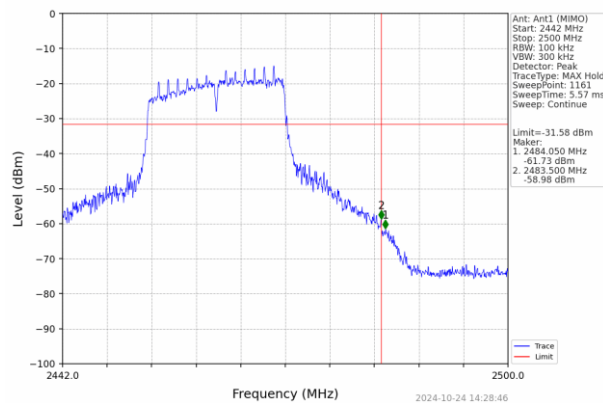


Report No.: HTT202408804F04

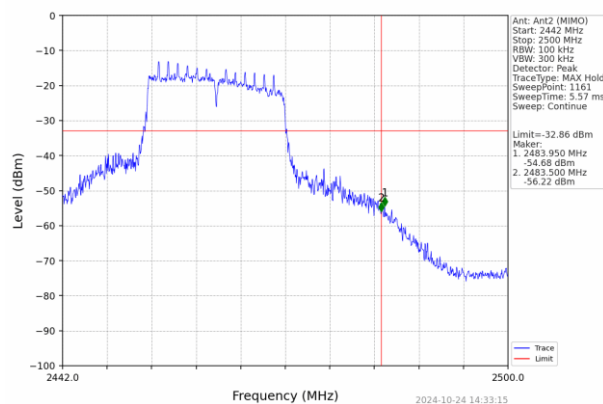
802.11n(HT20) LCH 2412MHz Ant2 (MIMO) NTN



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



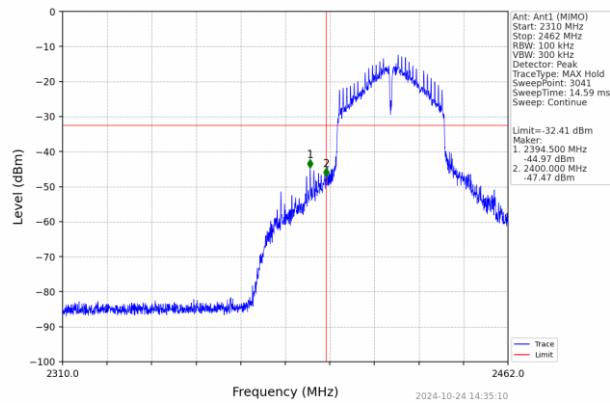
802.11n(HT20) HCH 2462MHz Ant2 (MIMO) NTN



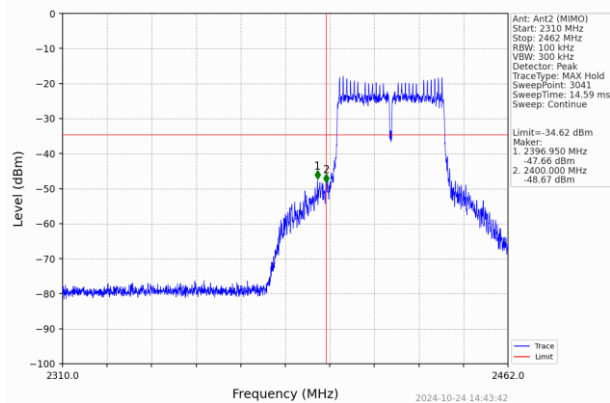


Report No.: HTT202408804F04

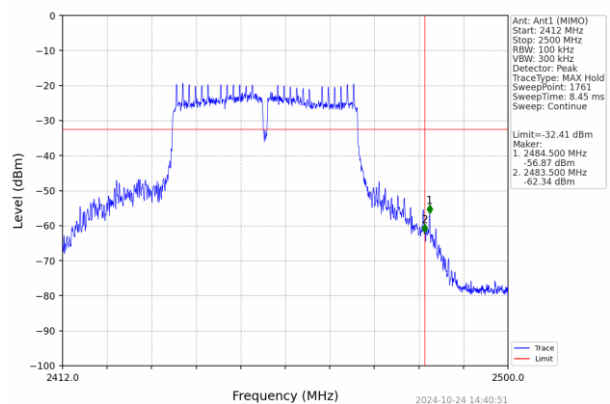
802.11n(HT40) LCH 2422MHz Ant1 (MIMO) NTN



802.11n(HT40) LCH 2422MHz Ant2 (MIMO) NTN



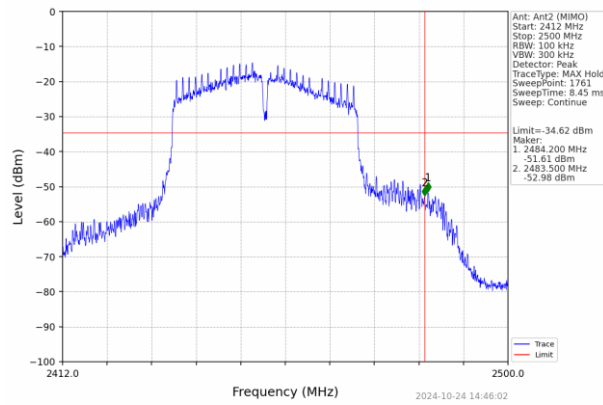
802.11n(HT40) HCH 2452MHz Ant1 (MIMO) NTN



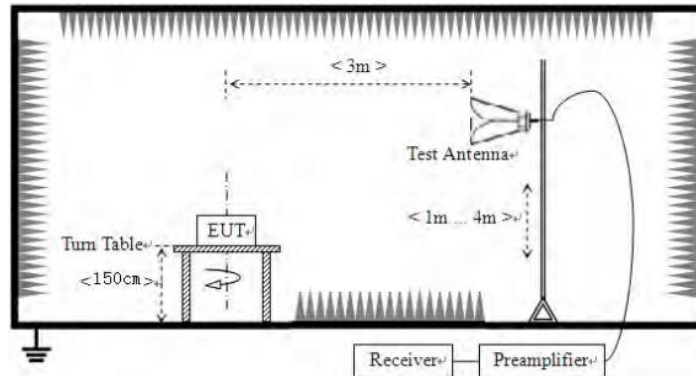


Report No.: HTT202408804F04

802.11n(HT40) HCH 2452MHz Ant2 (MIMO) NTN



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	

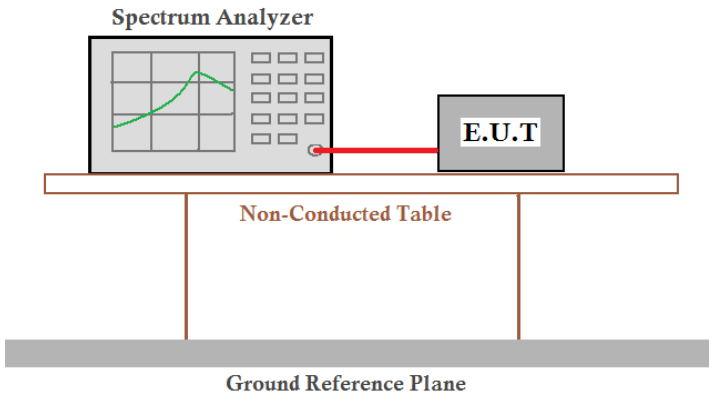
**Measurement Data**

Remark: During the test, pre-scan the 802.11b/802.11g/802.11n (H20)/802.11n (H40) modulation, and found the 802.11b 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	60.74	PK	74	13.26	62.13	27.2	4.31	32.9	-1.39
2390.00	44.33	AV	54	9.67	45.72	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	59.77	PK	74	14.23	61.16	27.2	4.31	32.9	-1.39
2390.00	45.07	AV	54	8.93	46.46	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	55.78	PK	74	18.22	56.71	27.4	4.47	32.8	-0.93
2483.50	43.85	AV	54	10.15	44.78	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	54.24	PK	74	19.76	55.17	27.4	4.47	32.8	-0.93
2483.50	43.63	AV	54	10.37	44.56	27.4	4.47	32.8	-0.93

6.6. Spurious Emission

6.6.1. Conducted Emission Method

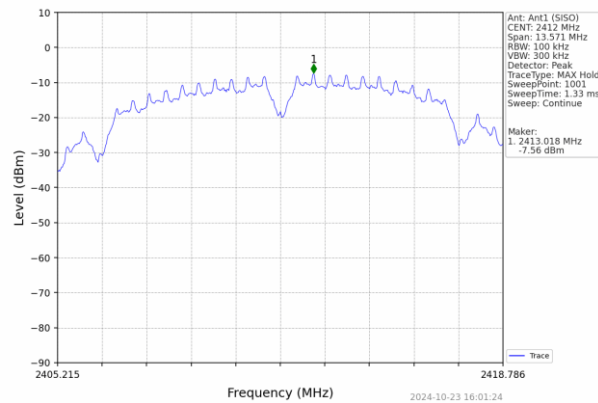
Test Requirement:	FCC Part15 C Section 15.247 (d)					
Test Method:	KDB558074 D01 15.247 Meas Guidance v05r02					
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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



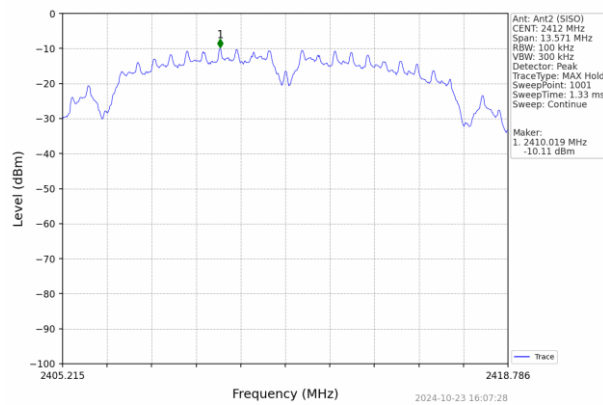
Report No.: HTT202408804F04

Measurement Data:

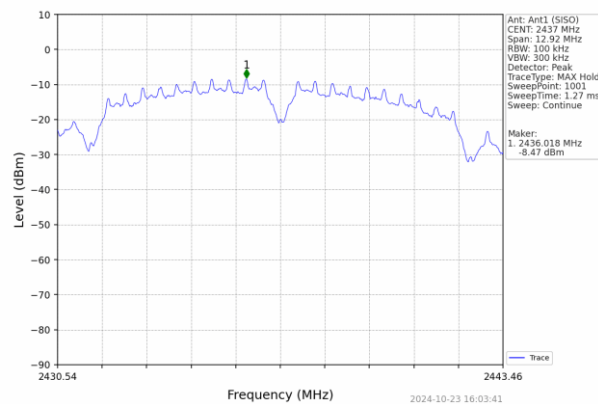
802.11b LCH 2412MHz_Ant1 (SISO) NTNv



802.11b LCH 2412MHz_Ant2 (SISO) NTNv



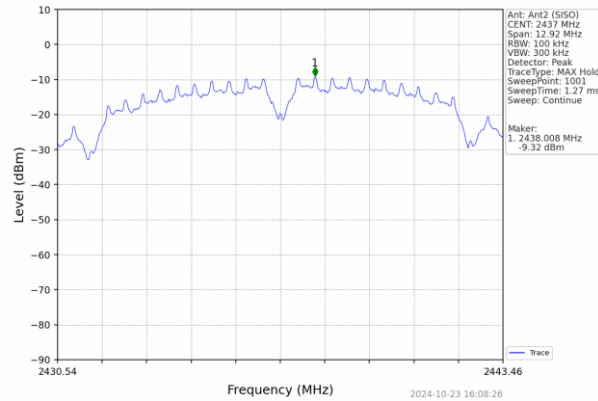
802.11b MCH 2437MHz_Ant1 (SISO) NTNv



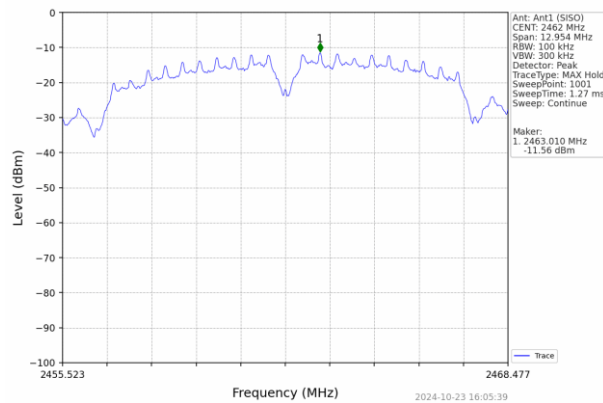


Report No.: HTT202408804F04

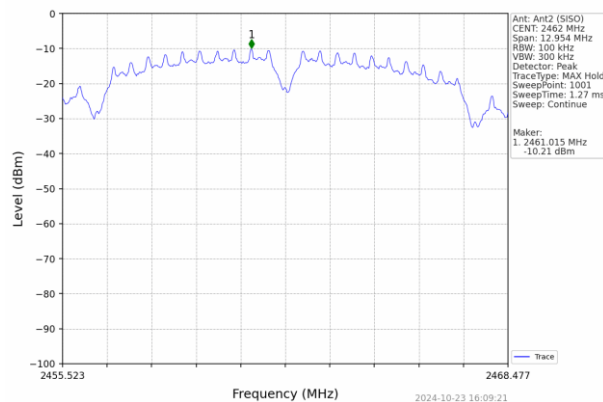
802.11b_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



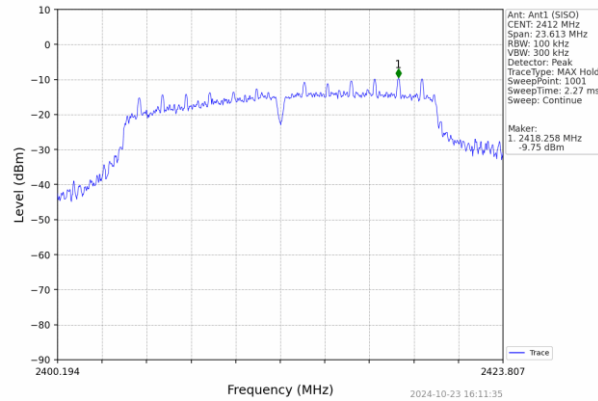
802.11b_HCH_2462MHz_Ant2 (SISO)_NTNV



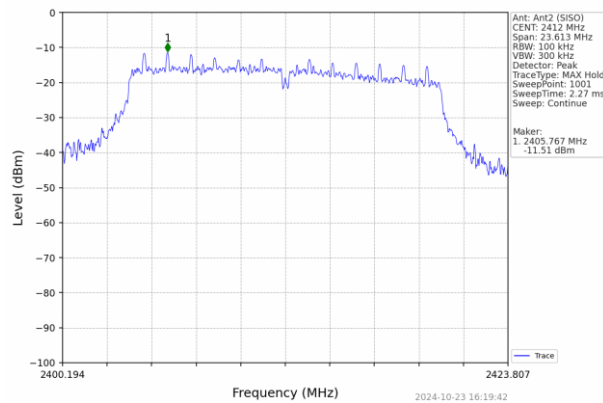


Report No.: HTT202408804F04

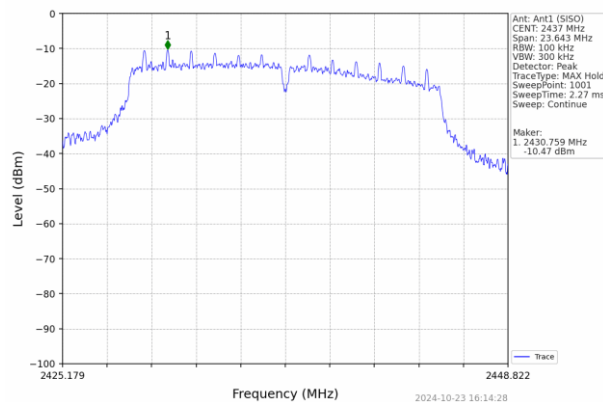
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant2 (SISO)_NTNV



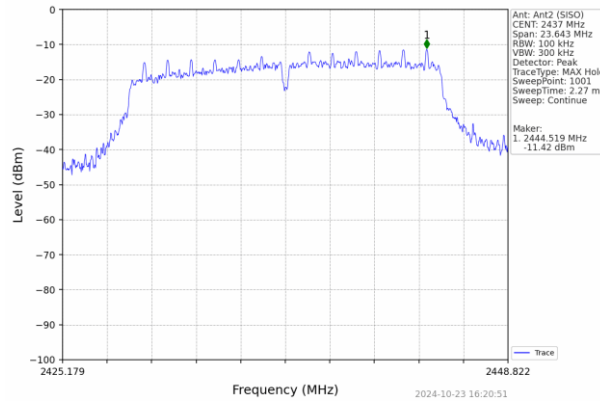
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



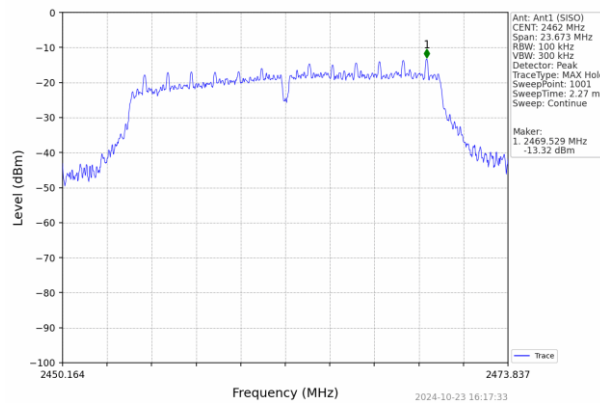


Report No.: HTT202408804F04

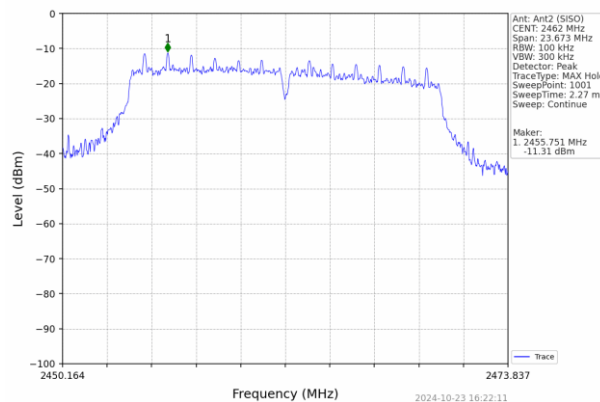
802.11g_MCH_2437MHz_Ant2 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



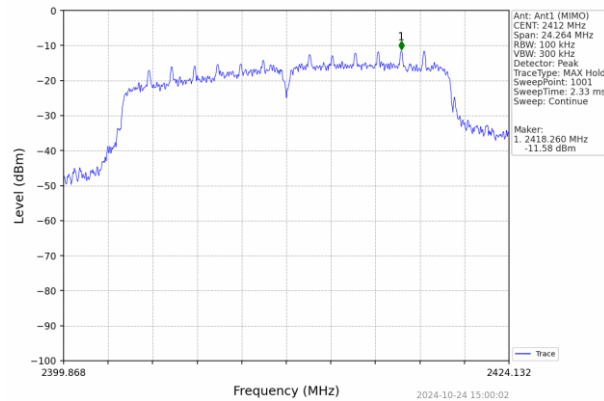
802.11g_HCH_2462MHz_Ant2 (SISO)_NTNV



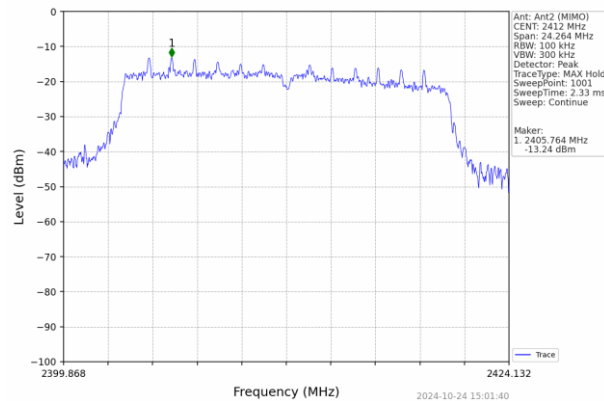


Report No.: HTT202408804F04

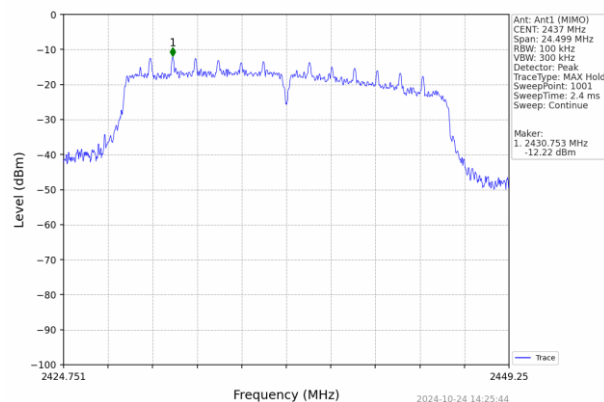
802.11n(HT20) LCH 2412MHz_Ant1 (MIMO) NTNv



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



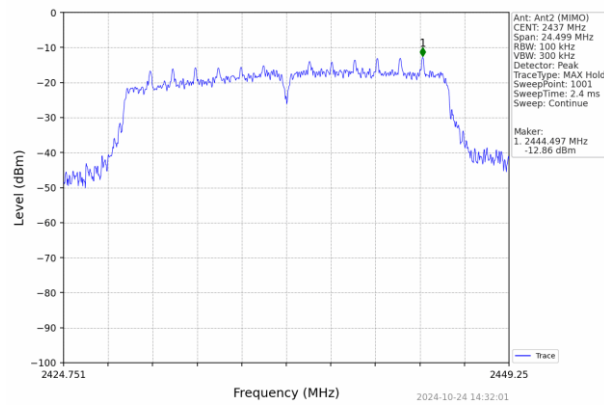
802.11n(HT20) MCH 2437MHz_Ant1 (MIMO) NTNv



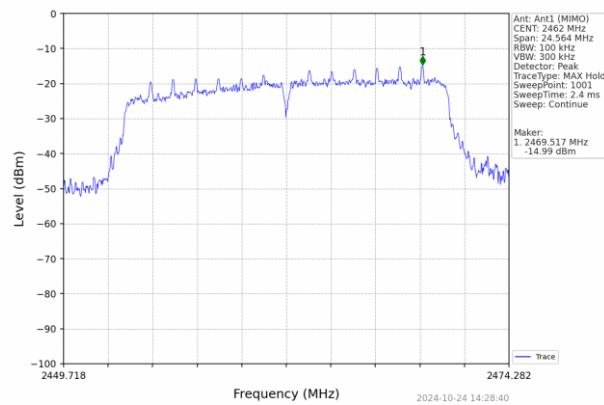


Report No.: HTT202408804F04

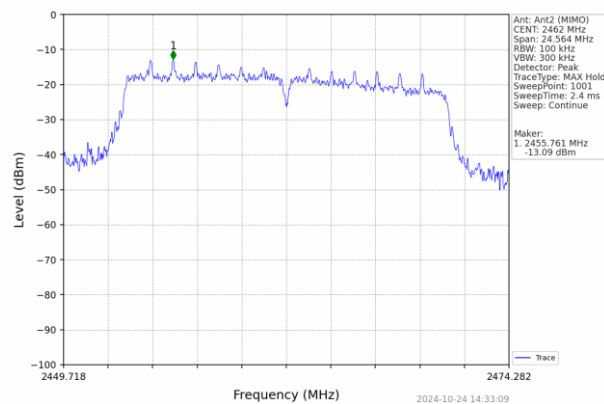
802.11n(HT20) MCH 2437MHz_Ant2 (MIMO) NTN



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



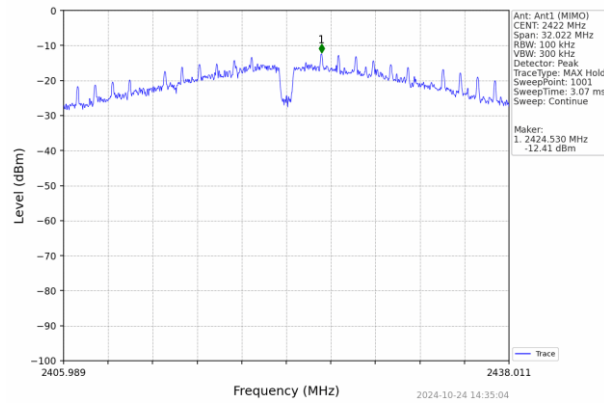
802.11n(HT20) HCH 2462MHz_Ant2 (MIMO) NTN



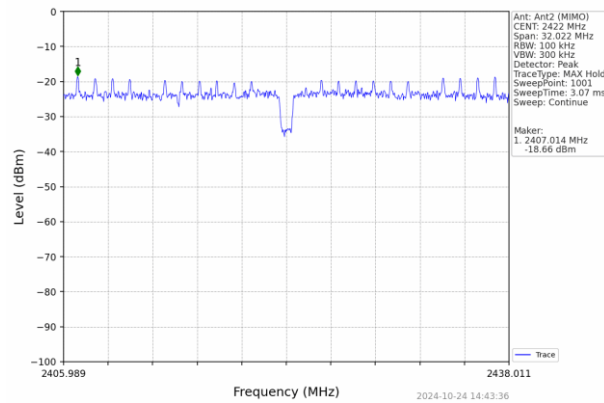


Report No.: HTT202408804F04

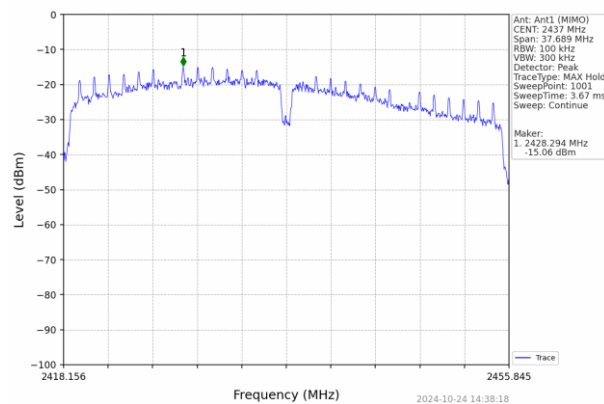
802.11n(HT40) LCH 2422MHz_Ant1 (MIMO) NTNv



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



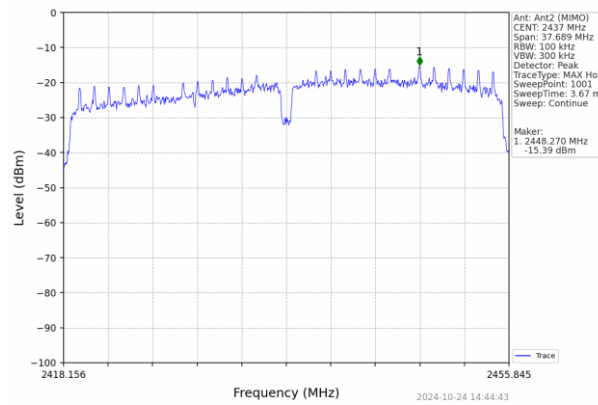
802.11n(HT40) MCH 2437MHz_Ant1 (MIMO) NTNv



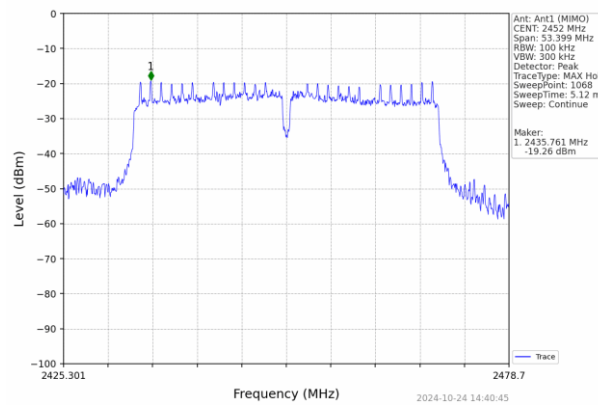


Report No.: HTT202408804F04

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



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



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

