

Report No.: KSCR220800138303

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TEST REPORT

Application No.: KSCR2208001383AT **FCC ID:** SVN-HMC5100X

Applicant: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

Address of Applicant: No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

Manufacturer: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

Address of Manufacturer: No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

Equipment Under Test (EUT):

EUT Name: HIGH-PERFORMANCE MODULE COMPUTER

Model No.: DHI-HMC5100X-H-708C2-W10A-BW,DHI-HMC5100X,

(The "#" symbols might consist of numbers from 0 to 9, letters from A to Z or a to z, "/", "-", space, and null, which indicates different sales regions, client codes, or software functions, and the product reliability and

electromagnetic compatibility remain the same.)

Please refer to section 2 of this report which indicates which model was

actually tested and which were electrically identical.

Standard(s): 47 CFR Part 15, Subpart C 15.247

Date of Receipt: 2022-08-09

Date of Test: 2022-08-15 to 2022-09-22

Date of Issue: 2022-10-02

Test Result: Pass*

Eric Lin Laboratory Manager

Jose fri



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



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	Revision Record					
Version	Version Description Date					
00	Original	2022-10-02	/			

Authorized for issue by:		
	Paun. Liu	
	Pawn.Liu/Project Engineer	-
	Eric fri	
	Eric Lin /Reviewer	_



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2 Test Summary

Radio Spectrum Technical Requirement						
Item Standard Method Requirement Resul						
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass		

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Result		
Conducted Emissions at AC Power Line (150kHz-30MHz)		ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass		
Conducted Average Output Power		ANSI C63.10 (2013) Section 11.9.2	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass		
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass		
Power Spectrum Density	47 CFR Part 15,	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass		
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass		
Conducted Spurious Emissions	Subpart C 15.247	ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass		
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass		
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass		
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass		

There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model DHI-HMC5100X-H-708C2-W10A-BW was tested since their differences are model number and The "#" symbols might consist of numbers from 0 to 9, letters from A to Z or a to z, "/", "-", space, and null, which indicates different sales regions, client codes, or software functions.



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 12V,7.5A or DC 19V,4.74A
	Adapter model:DPS-90AB-3
	Input:100-240V,1-2A,50/60Hz
	Output:12V,7.5A,90W
	Adapter model:FSP090-DIEBN2
	Input:100-240V,1.5A,50/60Hz
	Output:12V,4.74A
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	Antenna1:Dipole Antenna with RP-SMA connector,Antenna2:Dipole Antenna with RP-SMA connector
	Antenna1:4.43dBi (Provided by the manufacturer),
Antenna Gain:	Antenna2:4.43dBi (Provided by the manufacturer)
	Directional Gain: 7.44dBi
Test Voltage:	AC 120V/60Hz
Modulation Type: Number of Channels: Channel Spacing: Antenna Type: Antenna Gain:	2452MHz 802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11b/g/n(HT20):11;802.11n(HT40):7 5MHz Antenna1:Dipole Antenna with RP-SMA connector,Antenna2:Dipole Antenna with RP-SMA connector Antenna1:4.43dBi (Provided by the manufacturer), Antenna2:4.43dBi (Provided by the manufacturer) Directional Gain: 7.44dBi

4.2 Power level setting using in test:

4.2 1 over level county doing in toot.							
Channel	802.11b		802.11g		802.11n(HT20)		
	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
1	64	72	54	58	48	52	
6	66	74	56	60	48	52	
11	68	76	58	62	48	52	
Channel	802.11r	n(HT40)					
	Ant 1	Ant 2					
3	42	46					
6	46	50					
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4.3 Environment Parameter

Environment Parameter		Selected Values During Tests		
Relative Humidity		Ambient		
Value		Temperati	ure(°C)	Voltage(V)
NTNV		25		AC 120
Note:				
NV:Normal Voltage	LV:Low Extreme Test Vo	Itage	HV:High Extren	ne Test Voltage
NT:Normal Temperature	LT:Low Extreme Test Te	mperature	HT:High Extren	ne Test Temperature

4.4 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Displayer	LENOVO	T2054 pC	VNA246PX
Mouse	LENOVO	MS-370	512000000
Keyboard	LENOVO	SK-8827	8SSD50L80031AVLC0 5Y08DG



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4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 10 ⁻⁸
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	DE Dadiated Dawer	5.2dB (Below 1GHz)
0	RF Radiated Power	5.9dB (Above 1GHz)
		4.2dB (Below 30MHz)
9	Padiated Spurious Emission Test	4.5dB (30MHz-1GHz)
9	Radiated Spurious Emission Test	5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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4.6 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

- 1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
- 2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).

4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS

Compliance Certification Services (Kunshan) Inc. is accredited by the China National Accreditation Service for Conformity Assessment (CNAS). Registration No. CNAS L4354

A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



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5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date		
Condu	Conducted Emission at Mains Terminals (150kHz-30MHz)							
1	EMI Test Receive	R&S	ESCI	KS301101	01/22/2022	01/21/2023		
2	LISN	R&S	ENV216	KS301197	01/22/2022	01/21/2023		
3	LISN	Schwarzbeck	NNLK 8129	KS301091	01/22/2022	01/21/2023		
4	Pulse Limiter	R&S	ESH3-Z2	KUS1902E001	01/22/2022	01/21/2023		
5	CE test Cable	Thermax	/	CZ301102	11/14/2021	11/13/2022		
6	Test Software	Farad	EZ-EMC	/	N.C.R	N.C.R		
RF Co	nducted Test							
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/22/2022	08/21/2023		
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/22/2022	08/21/2023		
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/22/2022	01/21/2023		
4	Signal Generator	R&S	SMW200A	KSEM020-1	08/22/2022	08/21/2023		
5	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/22/2022	08/21/2023		
6	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/22/2022	08/21/2023		
7	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	04/01/2022	03/31/2023		
8	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/22/2022	08/21/2023		
9	Switcher	CCSRF	FY562	KUS2001M001-3	08/22/2022	08/21/2023		
10	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R		
11	DC Power Supply	Aglient	E3632A	KS301180	N.C.R	N.C.R		
12	Conducted Test Cable	Thermax	RF01-RF04	CZ301111- CZ301120	01/16/2022	01/15/2023		
13	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	04/01/2021	03/31/2023		
14	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	04/14/2022	04/13/2023		
15	Software	BST	TST-PASS	/	N/A	N/A		
RF Ra	diated Test							
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	08/22/2022	08/21/2023		
2	Universal Radio Communication Tester	R&S	CMW500	KSEM009-1	04/01/2022	03/31/2023		
3	Signal Generator	Agilent	E8257C	KS301066	08/22/2022	08/21/2023		
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	04/13/2021	04/12/2023		
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2021	06/28/2023		
6	Bilog Antenna	SCHWARZBECK	VULB9160	CZ301016	04/13/2021	04/12/2024		
7	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	KS301079	04/02/2022	04/01/2024		
8	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	02/22/2021	02/21/2023		
9	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	03/17/2022	03/16/2023		
10	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/22/2022	01/21/2023		
11	Amplifier(18~40GHz)	COM-POWER	PAM-840A	KUS1710E001	01/22/2022	01/21/2023		
12	RE Test Cable	REBES MICROWAVE	/	CZ301097	11/14/2021	11/13/2022		
13	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	01/04/2022	31/03/2023		
14	Software	Faratronic	EZ_EMC-v 3A1	/	N/A	N/A		



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

Standard Requirement:

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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna 1 and antenna 2 is Dipole antenna, and no consideration of replacement. The best case gain of the antenna 1 is 4.43dBi and antenna 2 is 4.43dBi. the directional gain is:7.44dBi.

Antenna location: Refer to internal photo.



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7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207 Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of	Conducted limit(dBµV)				
emission(MHz)	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.					
Detector: Peak for pre-scan (9k	Hz resolution bandwidth) 0.15M	to 30MHz			

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 41.0 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.



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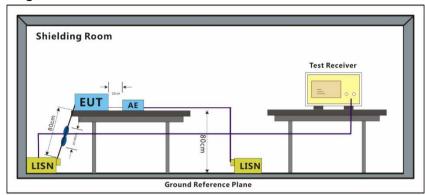
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7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50 \text{ohm}/50 \mu\text{H} + 5 \text{ohm}$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) 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 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



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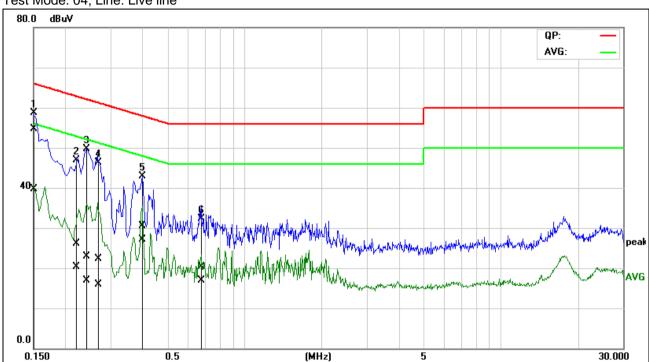
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Test Mode: 04; Line: Live line



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1511	35.17	20.28	19.50	54.67	39.78	65.94	55.94	-11.27	-16.16	Pass
2	0.2184	6.68	0.89	19.50	26.18	20.39	62.88	52.88	-36.70	-32.49	Pass
3	0.2399	3.35	-2.65	19.50	22.85	16.85	62.10	52.10	-39.25	-35.25	Pass
4	0.2702	2.87	-3.53	19.51	22.38	15.98	61.11	51.11	-38.73	-35.13	Pass
5	0.3981	10.97	7.56	19.53	30.50	27.09	57.89	47.89	-27.39	-20.80	Pass
6	0.6833	0.66	-2.69	19.57	20.23	16.88	56.00	46.00	-35.77	-29.12	Pass



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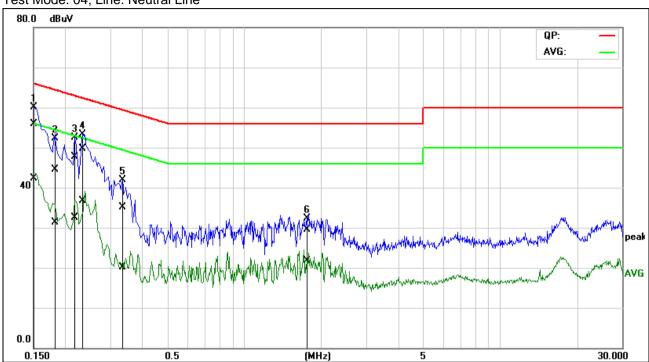
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Test Mode: 04; Line: Neutral Line



No.	Frequency	QuasiPeak	Average	Correction	QuasiPeak	Average	QuasiPeak	Average	QuasiPeak	Average	Remark
		reading	reading	factor	result	result	limit	limit	margin	margin	
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1500	36.43	22.85	19.50	55.93	42.35	66.00	56.00	-10.07	-13.65	Pass
2	0.1831	25.10	11.88	19.50	44.60	31.38	64.34	54.34	-19.74	-22.96	Pass
3	0.2158	28.14	13.00	19.50	47.64	32.50	62.98	52.98	-15.34	-20.48	Pass
4	0.2349	30.23	17.12	19.50	49.73	36.62	62.27	52.27	-12.54	-15.65	Pass
5	0.3340	15.59	0.60	19.52	35.11	20.12	59.35	49.35	-24.24	-29.23	Pass
6	1.7379	9.88	1.98	19.63	29.51	21.61	56.00	46.00	-26.49	-24.39	Pass



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7.2 Conducted Average Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method: ANSI C63.10 (2013) Section 11.9.2

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
	1 for ≥50 hopping channels
902-928	0.25 for 25≤ hopping channels <50
	1 for digital modulation
	1 for ≥75 non-overlapping hopping channels
2400-2483.5	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

Remark: The EUT 802.11N20&N40 mode supports 2 * 2 MIMO transmission. The gain for Antenna 1 is 4.43dBi and for Antenna 2 is 4.43dBi, and the directional antenna gain is 7.44dBi. Therefore, the power limit should be reduced from the part exceeding 6, 2400-2483.5MHz: 28.56dBm

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 41.0 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.



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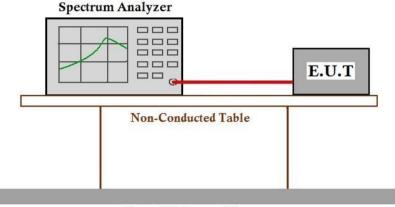
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7.2.3 Test Setup Diagram



Ground Reference Plane

7.2.4 Measurement Procedure and Data

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.

Please Refer to Appendix for Details



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7.3 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit:

≥500 kHz

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 41.0 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

7.5.2 TC3t W	7.3.2 Test Mode Description				
Pre-scan / Final test	Mode Code	Description			
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.			
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.			



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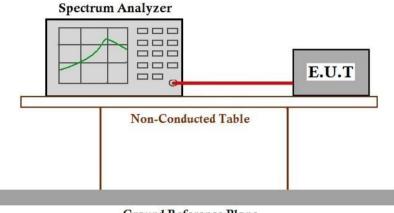
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7.3.3 Test Setup Diagram



Ground Reference Plane

7.3.4 Measurement Procedure and Data

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7.4 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)
Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

Remark: The EUT 802.11N20&N40 mode supports 2 * 2 MIMO transmission. The gain for Antenna 1 is 4.43dBi and for Antenna 2 is 4.43dBi, and the directional antenna gain is 7.44dBi. Therefore, power spectral density limit should be reduced from the part exceeding 6, 2400-2483.5MHz: 6.56dBm/3KHz.

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 40.9 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.



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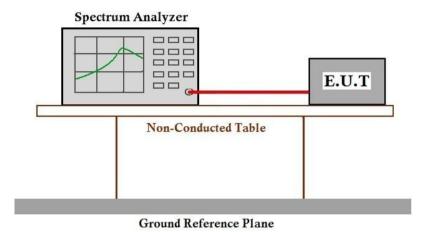
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7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

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7.5 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c).

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 40.9 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

1.3.2 Test IV	7.5.2 Test Mode Description				
Pre-scan / Final test	Mode Code	Description			
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.			
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.			



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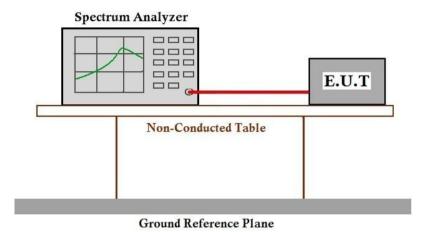
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7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

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7.6 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)
Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c).

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 23.6 °C Humidity: 40.9 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

7.0.2 TEST IV	7.6.2 Test Mode Description				
Pre-scan / Final test	Mode Code	Description			
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.			
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.			



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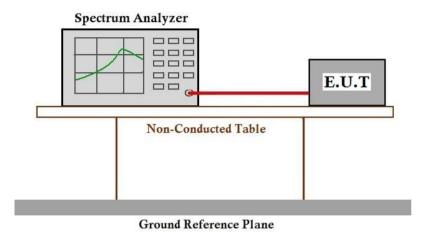
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7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

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7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.10.5

Limit:

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

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

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.8 °C Humidity: 60.0 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

	7.7.2 Test mode Description				
Pre-scan / Final test	Mode Code	Description			
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.			
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation			



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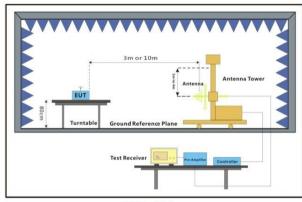


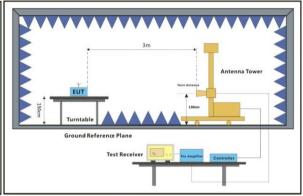
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and worse data rates. Only the data of worst case is recorded in the report.

7.7.3 Test Setup Diagram





30MHz-1GHz Above 1GHz



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7.7.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.
- Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- 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.
- Remark 3: For WLAN radiated test, according to the conducted power and verify test the SISO & MIMO mode, the worst-case is SISO mode for 802.11b/g, MIMO mode for 802.11n, therefore, all final test are performed in SISO & MIMO mode and reported.



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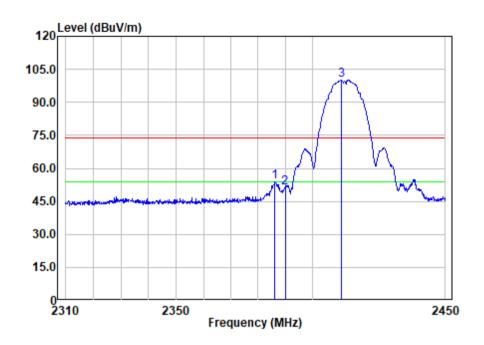
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2386.300	0.00	42.92	64.43	53.92	74.00	-20.08	Peak	
2	2390.000	0.00	42.92	61.53	51.03	74.00	-22.97	Peak	
3	2410.800	0.00	42.93	110.43	100.00	74.00	26.00	Peak	



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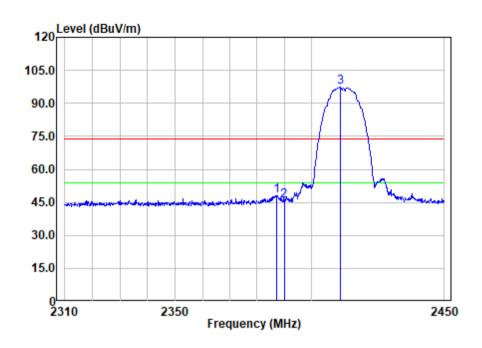
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Test Mode: 04; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2387.140	0.00	42.92	58.73	48.22	74.00	-25.78	Peak	
2	2390.000	0.00	42.92	56.37	45.87	74.00	-28.13	Peak	
3	2410.800	0.00	42.93	107.66	97.23	74.00	23.23	Peak	



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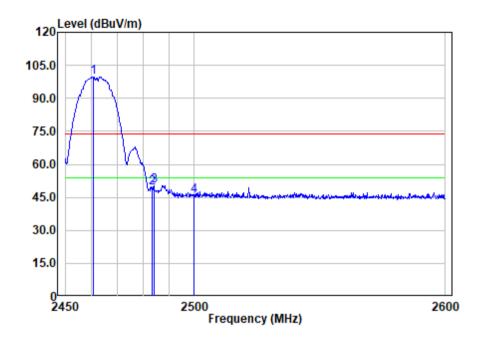
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2460.800	0.00	42.94	109.78	99.59	74.00	25.59	Peak
2	2483.500	0.00	42.94	59.59	49.52	74.00	-24.48	Peak
3	2484.200	0.00	42.94	60.49	50.42	74.00	-23.58	Peak
4	2500.000	0.00	42.94	55.93	45.94	74.00	-28.06	Peak



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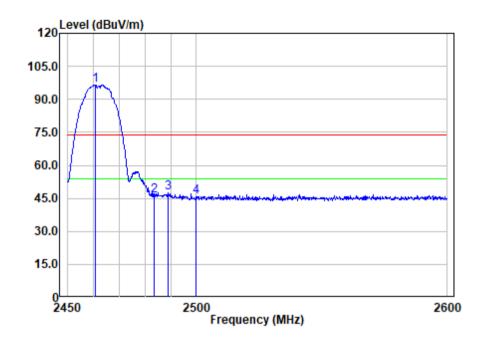
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Test Mode: 04; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
-	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	——dB	
1	2460.800	0.00	42.94	106.62	96.43	74.00	22.43	Peak
2	2483.500	0.00	42.94	56.32	46.25	74.00	-27.75	Peak
3	2488.850	0.00	42.94	57.46	47.41	74.00	-26.59	Peak
4	2500.000	0.00	42.94	55.50	45.51	74.00	-28.49	Peak



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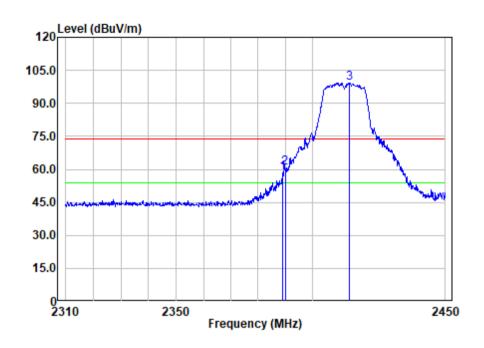
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2389.240	0.00	42.92	68.89	58.39	74.00	-15.61	Peak	
2	2390.000	0.00	42.92	70.97	60.47	74.00	-13.53	Peak	
3	2414.020	0.00	42.93	109.76	99.35	74.00	25.35	Peak	



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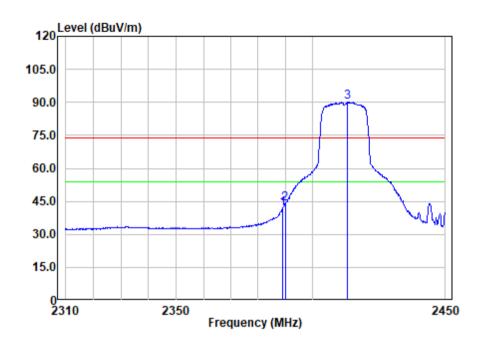
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2389.100	0.00	42.92	52.29	41.79	54.00	-12.21	Average	
2	2390.000	0.00	42.92	54.24	43.74	54.00	-10.26	Average	
3	2413.180	0.00	42.93	100.50	90.09	54.00	36.09	Average	



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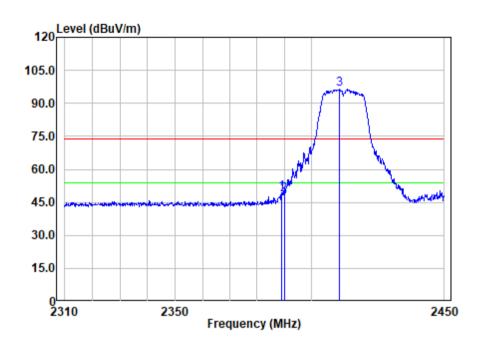
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Test Mode: 04; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
2389.240	0.00	42.92	59.79	49.29	74.00	-24.71	Peak	
2390.000	0.00	42.92	58.96	48.46	74.00	-25.54	Peak	
2410.660	0.00	42.93	106.90	96.47	74.00	22.47	Peak	
	MHz 2389.240 2390.000	Freq Factor MHz dB 2389.240 0.00 2390.000 0.00	MHz dB dB 2389.240 0.00 42.92 2390.000 0.00 42.92	MHz dB dB dBuV 2389.240 0.00 42.92 59.79 2390.000 0.00 42.92 58.96	MHz dB dB dBuV dBuV/m 2389.240 0.00 42.92 59.79 49.29 2390.000 0.00 42.92 58.96 48.46	MHz dB dB dBuV dBuV/m dBuV/m dBuV/m 2389.240 0.00 42.92 59.79 49.29 74.00 2390.000 0.00 42.92 58.96 48.46 74.00	MHz dB dB dBuV dBuV/m dBuV/m dB 2389.240 0.00 42.92 59.79 49.29 74.00 -24.71 2390.000 0.00 42.92 58.96 48.46 74.00 -25.54	Freq Factor Factor Level Level Line Limit Remark



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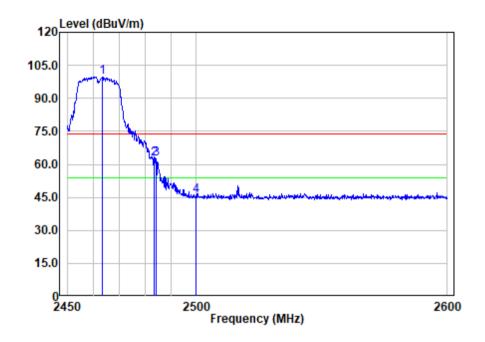
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2463.650	0.00	42.94	109.97	99.80	74.00	25.80	Peak
2	2483.500	0.00	42.94	72.46	62.39	74.00	-11.61	Peak
3	2484.500	0.00	42.94	72.41	62.34	74.00	-11.66	Peak
4	2500.000	0.00	42.94	55.60	45.61	74.00	-28.39	Peak



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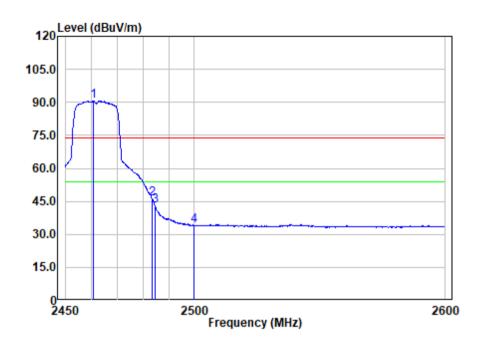
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2460.800	0.00	42.94	100.78	90.59	54.00	36.59	Average
2	2483.500	0.00	42.94	56.32	46.25	54.00	-7.75	Average
3	2484.650	0.00	42.94	53.28	43.21	54.00	-10.79	Average
4	2500.000	0.00	42.94	43.95	33.96	54.00	-20.04	Average



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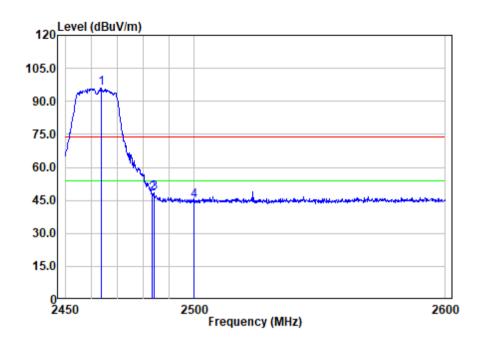
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Test Mode: 04; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2463.800	0.00	42.94	106.04	95.87	74.00	21.87	Peak
2	2483.500	0.00	42.94	58.19	48.12	74.00	-25.88	Peak
3	2484.350	0.00	42.94	58.47	48.40	74.00	-25.60	Peak
4	2500.000	0.00	42.94	54.79	44.80	74.00	-29.20	Peak



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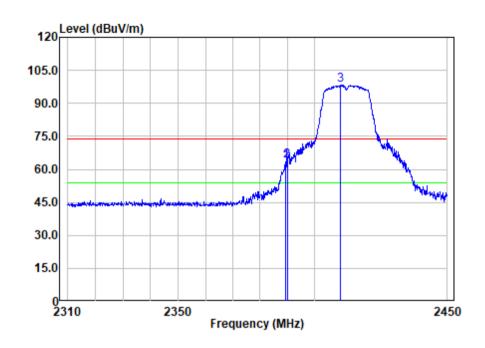
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
2389.520	0.00	42.92	73.72	63.22	74.00	-10.78	Peak	
2390.000	0.00	42.92	74.24	63.74	74.00	-10.26	Peak	
2409.960	0.00	42.93	108.77	98.34	74.00	24.34	Peak	
	MHz 2389.520 2390.000	Freq Factor MHz dB 2389.520 0.00 2390.000 0.00	HHz dB dB 2389.520 0.00 42.92 2390.000 0.00 42.92	MHz dB dB dBuV 2389.520 0.00 42.92 73.72 2390.000 0.00 42.92 74.24	MHz dB dB dBuV dBuV/m 2389.520 0.00 42.92 73.72 63.22 2390.000 0.00 42.92 74.24 63.74	MHz dB dB dBuV dBuV/m dBuV/m 2389.520 0.00 42.92 73.72 63.22 74.00 2390.000 0.00 42.92 74.24 63.74 74.00	MHz dB dB dBuV dBuV/m dBuV/m dB 2389.520 0.00 42.92 73.72 63.22 74.00 -10.78 2390.000 0.00 42.92 74.24 63.74 74.00 -10.26	Freq Factor Factor Level Level Line Limit Remark



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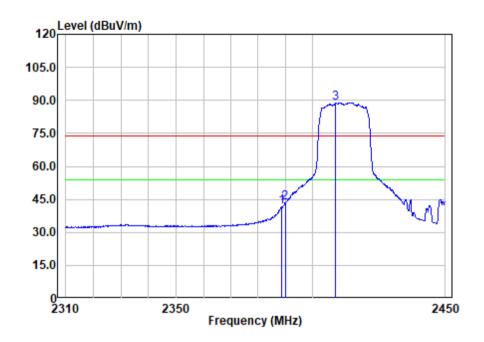
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2388.540	0.00	42.92	52.04	41.54	54.00	-12.46	Average	
2	2390.000	0.00	42.92	53.84	43.34	54.00	-10.66	Average	
3	2408.700	0.00	42.93	99.27	88.83	54.00	34.83	Average	



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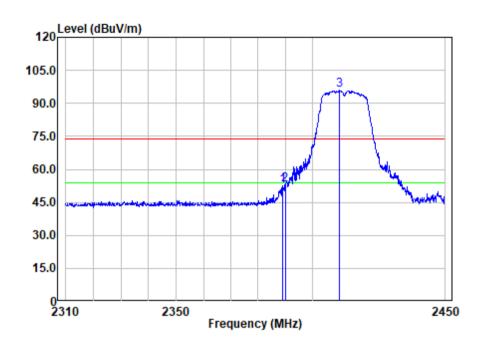
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2389.240	0.00	42.92	63.15	52.65	74.00	-21.35	Peak	
2	2390.000	0.00	42.92	63.54	53.04	74.00	-20.96	Peak	
3	2410.240	0.00	42.93	106.28	95.85	74.00	21.85	Peak	



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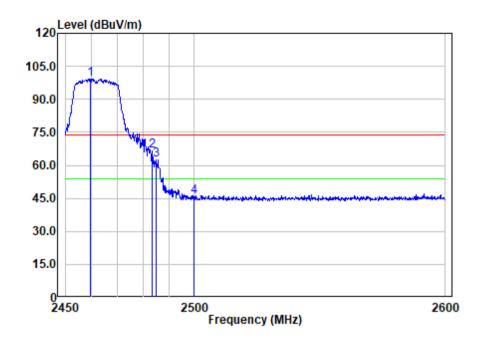
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	——dB	
1	2459.750	0.00	42.94	109.40	99.21	74.00	25.21	Peak
2	2483.500	0.00	42.94	76.42	66.35	74.00	-7.65	Peak
3	2484.950	0.00	42.94	72.68	62.62	74.00	-11.38	Peak
4	2500.000	0.00	42.94	55.95	45.96	74.00	-28.04	Peak



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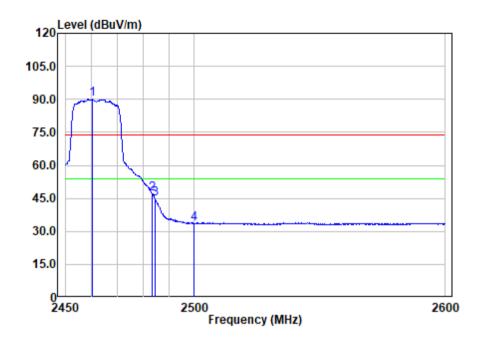
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2460.350	0.00	42.94	100.18	89.99	54.00	35.99	Average
2	2483.500	0.00	42.94	57.28	47.21	54.00	-6.79	Average
3	2484.800	0.00	42.94	54.75	44.69	54.00	-9.31	Average
4	2500.000	0.00	42.94	43.49	33.50	54.00	-20.50	Average



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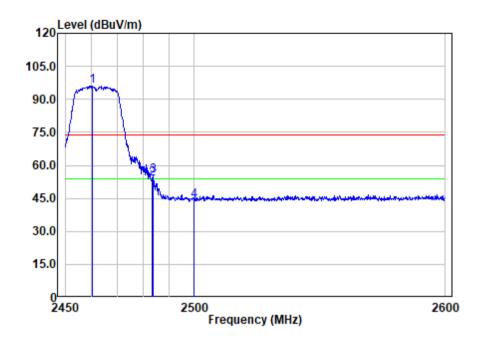
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
-	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	——dB	
1	2460.650	0.00	42.94	106.17	95.98	74.00	21.98	Peak
2	2483.500	0.00	42.94	63.98	53.91	74.00	-20.09	Peak
3	2483.900	0.00	42.94	65.30	55.23	74.00	-18.77	Peak
4	2500.000	0.00	42.94	54.08	44.09	74.00	-29.91	Peak



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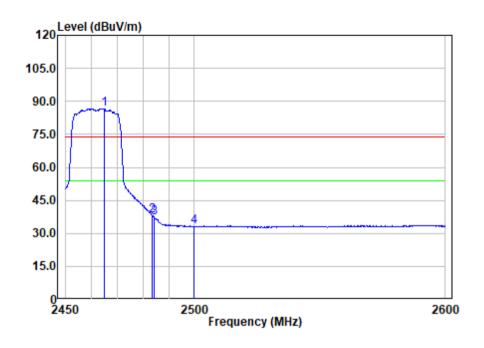
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2465.150	0.00	42.94	96.87	86.70	54.00	32.70	Average
2	2483.500	0.00	42.94	48.25	38.18	54.00	-15.82	Average
3	2484.350	0.00	42.94	47.40	37.33	54.00	-16.67	Average
4	2500.000	0.00	42.94	43.03	33.04	54.00	-20.96	Average



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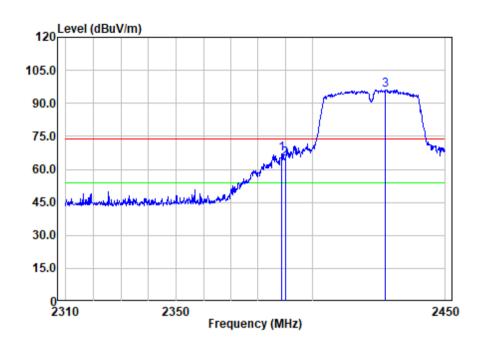
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
•								
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
2388.820	0.00	42.92	77.53	67.03	74.00	-6.97	Peak	
2390.000	0.00	42.92	75.16	64.66	74.00	-9.34	Peak	
2427.460	0.00	42.93	106.51	96.17	74.00	22.17	Peak	
	MHz 2388.820 2390.000	Freq Factor MHz dB 2388.820 0.00 2390.000 0.00	Freq Factor Factor MHz dB dB 2388.820 0.00 42.92 2390.000 0.00 42.92	MHz dB dB dBuV 2388.820 0.00 42.92 77.53 2390.000 0.00 42.92 75.16	MHz dB dB dBuV dBuV/m 2388.820 0.00 42.92 77.53 67.03 2390.000 0.00 42.92 75.16 64.66	MHz dB dB dBuV dBuV/m dBuV/m 2388.820 0.00 42.92 77.53 67.03 74.00 2390.000 0.00 42.92 75.16 64.66 74.00	MHz dB dB dBuV dBuV/m dBuV/m dB 2388.820 0.00 42.92 77.53 67.03 74.00 -6.97 2390.000 0.00 42.92 75.16 64.66 74.00 -9.34	Freq Factor Factor Level Level Line Limit Remark



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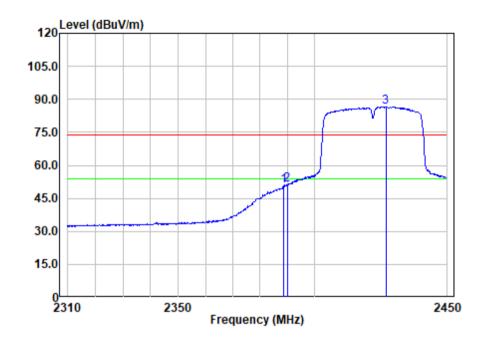
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
2388.540	0.00	42.92	61.00	50.50	54.00	-3.50	Average	
2390.000	0.00	42.92	61.47	50.97	54.00	-3.03	Average	
2426.760	0.00	42.93	96.89	86.55	54.00	32.55	Average	
	MHz 2388.540 2390.000	Freq Factor MHz dB 2388.540 0.00 2390.000 0.00	MHz dB dB 2388.540 0.00 42.92 2390.000 0.00 42.92	MHz dB dB dBuV 2388.540 0.00 42.92 61.00 2390.000 0.00 42.92 61.47	MHz dB dB dBuV dBuV/m 2388.540 0.00 42.92 61.00 50.50 2390.000 0.00 42.92 61.47 50.97	MHz dB dB dBuV dBuV/m dBuV/m 2388.540 0.00 42.92 61.00 50.50 54.00 2390.000 0.00 42.92 61.47 50.97 54.00	MHz dB dB dBuV dBuV/m dBuV/m dB 2388.540 0.00 42.92 61.00 50.50 54.00 -3.50 2390.000 0.00 42.92 61.47 50.97 54.00 -3.03	Freq Factor Level Level Line Limit Remark MHz dB dB dBuV dBuV/m dBuV/m dB 2388.540 0.00 42.92 61.00 50.50 54.00 -3.50 Average



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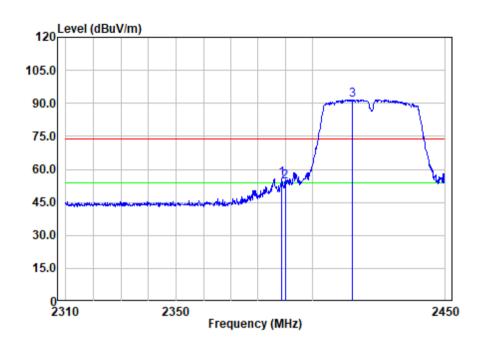
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
2388.820	0.00	42.92	66.25	55.75	74.00	-18.25	Peak	
2390.000	0.00	42.92	64.66	54.16	74.00	-19.84	Peak	
2414.860	0.00	42.93	102.09	91.68	74.00	17.68	Peak	
	MHz 2388.820 2390.000	Freq Factor MHz dB 2388.820 0.00 2390.000 0.00	Hreq Factor Factor MHz dB dB 2388.820 0.00 42.92 2390.000 0.00 42.92	MHz dB dB dBuV 2388.820 0.00 42.92 66.25 2390.000 0.00 42.92 64.66	MHz dB dB dBuV dBuV/m 2388.820 0.00 42.92 66.25 55.75 2390.000 0.00 42.92 64.66 54.16	MHz dB dB dBuV dBuV/m dBuV/m 2388.820 0.00 42.92 66.25 55.75 74.00 2390.000 0.00 42.92 64.66 54.16 74.00	MHz dB dB dBuV dBuV/m dBuV/m dB 2388.820 0.00 42.92 66.25 55.75 74.00 -18.25 2390.000 0.00 42.92 64.66 54.16 74.00 -19.84	Freq Factor Factor Level Level Line Limit Remark



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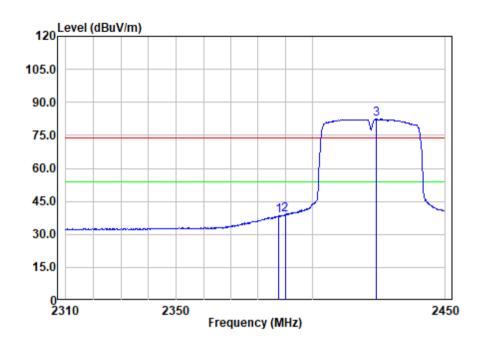
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		_
2387.560	0.00	42.92	48.82	38.31	54.00	-15.69	Average	
2390.000	0.00	42.92	49.62	39.12	54.00	-14.88	Average	
2424.100	0.00	42.93	92.62	82.26	54.00	28.26	Average	
	MHz 2387.560 2390.000	Freq Factor MHz dB 2387.560 0.00 2390.000 0.00	MHz dB dB 2387.560 0.00 42.92 2390.000 0.00 42.92	MHz dB dB dBuV 2387.560 0.00 42.92 48.82 2390.000 0.00 42.92 49.62	MHz dB dB dBuV dBuV/m 2387.560 0.00 42.92 48.82 38.31 2390.000 0.00 42.92 49.62 39.12	MHz dB dB dBuV dBuV/m dBuV/m 2387.560 0.00 42.92 48.82 38.31 54.00 2390.000 0.00 42.92 49.62 39.12 54.00	MHz dB dB dBuV dBuV/m dBuV/m dB 2387.560 0.00 42.92 48.82 38.31 54.00 -15.69 2390.000 0.00 42.92 49.62 39.12 54.00 -14.88	Freq Factor Level Level Line Limit Remark MHz dB dB dBuV dBuV/m dBuV/m dB 2387.560 0.00 42.92 48.82 38.31 54.00 -15.69 Average



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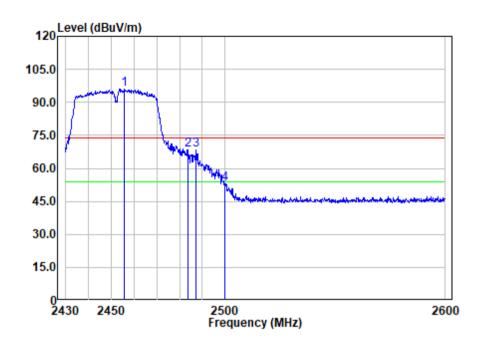
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
-	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	——dB		
1	2455.670	0.00	42.94	106.22	96.01	74.00	22.01	Peak	
2	2483.500	0.00	42.94	78.49	68.42	74.00	-5.58	Peak	
3	2487.290	0.00	42.94	78.35	68.29	74.00	-5.71	Peak	
4	2500.000	0.00	42.94	63.10	53.11	74.00	-20.89	Peak	



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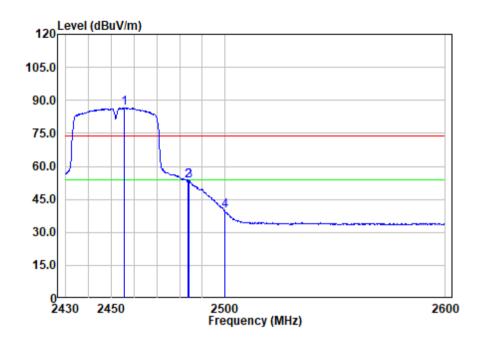
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2455.500	0.00	42.94	96.71	86.50	54.00	32.50	Average
2	2483.500	0.00	42.94	63.52	53.45	54.00	-0.55	Average
3	2484.230	0.00	42.94	63.65	53.58	54.00	-0.42	Average
4	2500.000	0.00	42.94	49.76	39.77	54.00	-14.23	Average



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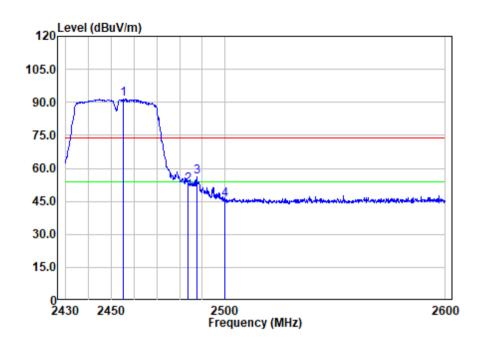
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz				dBuV/m	dBuV/m		
	ппΖ							
1	2455.160	0.00	42.94	101.71	91.50	74.00	17.50	Peak
2	2483.500	0.00	42.94	62.60	52.53	74.00	-21.47	Peak
3	2487.460	0.00	42.94	66.43	56.37	74.00	-17.63	Peak
4	2500.000	0.00	42.94	55.91	45.92	74.00	-28.08	Peak



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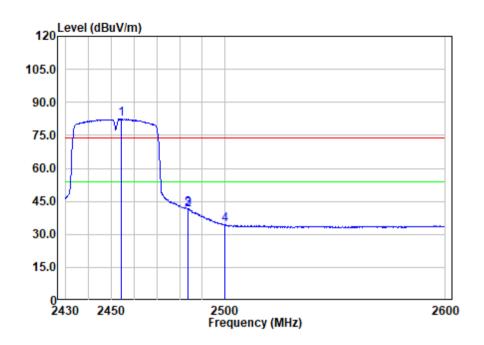
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2454.310	0.00	42.94	92.52	82.30	54.00	28.30	Average
2	2483.500	0.00	42.94	51.42	41.35	54.00	-12.65	Average
3	2483.890	0.00	42.94	51.72	41.65	54.00	-12.35	Average
4	2500.000	0.00	42.94	44.49	34.50	54.00	-19.50	Average



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7.8 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 21.0 °C Humidity: 51.2 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.



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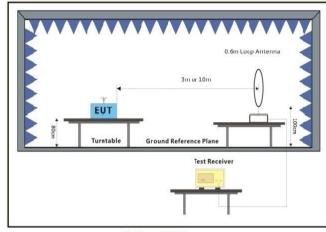
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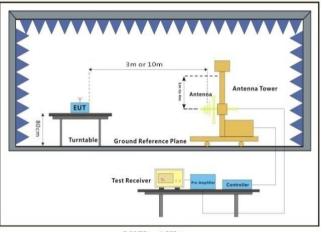


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7.8.3 Test Setup Diagram





Below 30MHz 30MHz-1GHz



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7.8.4 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. 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.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete. Remark:
- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 9kHz to 30MHz, the disturbance 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.
- 3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 4. For WLAN radiated test, according to the conducted power and verify test the SISO & MIMO mode, the worst-case is SISO mode for 802.11b/g, MIMO mode for 802.11n, therefore, all final test are performed in SISO & MIMO mode . only the worst data recorded at report.



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Test Mode: 04; Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	62.4314	14.29	14.68	28.97	40.00	-11.03	100	293	QP
2	126.7723	12.81	19.46	32.27	43.50	-11.23	100	54	QP
3	226.8935	21.69	17.25	38.94	46.00	-7.06	100	360	QP
4	263.8190	12.62	21.02	33.64	46.00	-12.36	100	131	QP
5	701.7610	34.77	2.48	37.25	46.00	-8.75	100	323	QP
6	801.7863	37.87	2.25	40.12	46.00	-5.88	100	323	QP



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Test Mode: 04; Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	33.9174	5.61	24.91	30.52	40.00	-9.48	100	191	QP
2	62.8708	17.01	14.69	31.70	40.00	-8.30	101	0	QP
3	125.8864	15.76	19.45	35.21	43.50	-8.29	100	6	QP
4	229.2931	21.87	17.50	39.37	46.00	-6.63	100	30	QP
5	449.5558	7.63	24.24	31.87	46.00	-14.13	100	338	QP
6	601.4265	9.76	27.09	36.85	46.00	-9.15	100	237	QP



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7.9 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.6

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 22.8 °C Humidity: 60.0 % RH Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

7.0.2 Test mode bescription							
Pre-scan / Final test	Mode Code	Description					
Final test	04	TX mode_Power by adapter DPS-90AB-3 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.					
Pre-scan	13	TX mode_Power by adapter FSP090-DIEBN2 and Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.					



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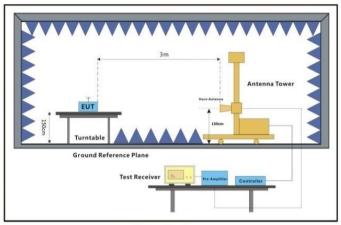
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7.9.3 Test Setup Diagram



Above 1GHz



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7.9.4 Measurement Procedure and Data

- a. 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.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete. Remark:
- 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 2. Scan from 1GHz to 25GHz, the disturbance above 18GHz 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.
- 3. As shown in this section, 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.
- 4. For WLAN radiated test, according to the conducted power and verify test the SISO & MIMO mode, the worst-case is SISO mode for 802.11b/g, MIMO mode for 802.11n, therefore, all final test are performed in SISO & MIMO mode and reported.



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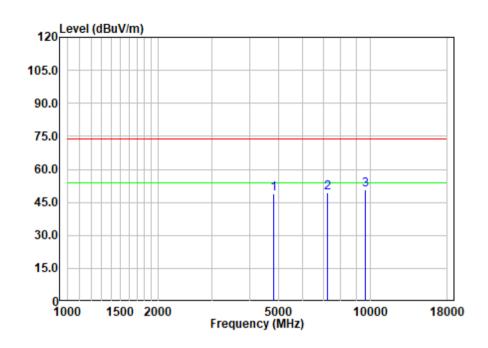
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	4824.000	0.00	42.24	48.92	48.99	74.00	-25.01	Peak	
2	7236.000	0.00	42.61	45.95	49.15	74.00	-24.85	Peak	
3	9648.000	0.00	42.32	43.65	50.61	74.00	-23.39	Peak	



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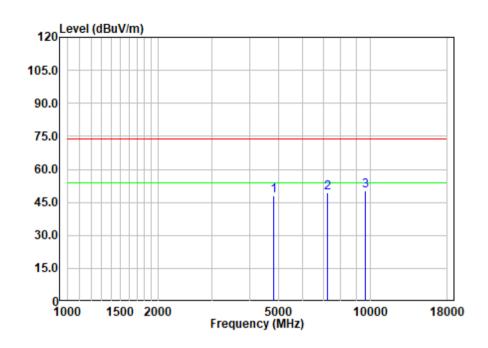
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Test Mode: 04; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
4824.000	0.00	42.24	48.12	48.19	74.00	-25.81	Peak	
7236.000	0.00	42.61	46.08	49.28	74.00	-24.72	Peak	
9648.000	0.00	42.32	43.46	50.42	74.00	-23.58	Peak	
	MHz 4824.000 7236.000	Freq Factor MHz dB 4824.000 0.00 7236.000 0.00	MHz dB dB 4824.000 0.00 42.24 7236.000 0.00 42.61	MHz dB dB dBuV 4824.000 0.00 42.24 48.12 7236.000 0.00 42.61 46.08	MHz dB dB dBuV dBuV/m 4824.000 0.00 42.24 48.12 48.19 7236.000 0.00 42.61 46.08 49.28	MHz dB dB dBuV dBuV/m dBuV/m 4824.000 0.00 42.24 48.12 48.19 74.00 7236.000 0.00 42.61 46.08 49.28 74.00	MHz dB dB dBuV dBuV/m dBuV/m dB 4824.000 0.00 42.24 48.12 48.19 74.00 -25.81 7236.000 0.00 42.61 46.08 49.28 74.00 -24.72	Freq Factor Factor Level Level Line Limit Remark MHz dB dB dBuV dBuV/m dBuV/m dB



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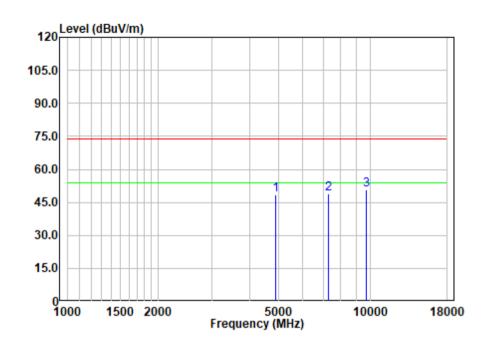
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



	Aux	Preamp	Read		Limit	0ver	
Freq	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
4874.000	0.00	41.92	47.99	48.41	74.00	-25.59	Peak
7311.000	0.00	42.50	45.73	49.13	74.00	-24.87	Peak
9748.000	0.00	42.61	43.80	50.63	74.00	-23.37	Peak
	MHz 4874.000 7311.000	Freq Factor MHz dB 4874.000 0.00 7311.000 0.00	MHz dB dB 4874.000 0.00 41.92 7311.000 0.00 42.50	MHz dB dB dBuV 4874.000 0.00 41.92 47.99 7311.000 0.00 42.50 45.73	MHz dB dB dBuV dBuV/m 4874.000 0.00 41.92 47.99 48.41 7311.000 0.00 42.50 45.73 49.13	MHz dB dB dBuV dBuV/m dBuV/m 4874.000 0.00 41.92 47.99 48.41 74.00 7311.000 0.00 42.50 45.73 49.13 74.00	Aux Preamp Read Limit Over Freq Factor Factor Level Level Line Limit MHz dB dB dBuV dBuV/m dBuV/m dB dB 4874.000 0.00 41.92 47.99 48.41 74.00 -25.59 7311.000 0.00 42.50 45.73 49.13 74.00 -24.87 9748.000 0.00 42.61 43.80 50.63 74.00 -23.37



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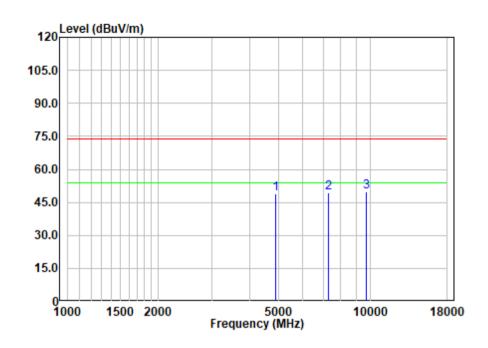
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Test Mode: 04; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	•								
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	4874.000	0.00	41.92	48.35	48.77	74.00	-25.23	Peak	
2	7311.000	0.00	42.50	46.13	49.53	74.00	-24.47	Peak	
3	9748.000	0.00	42.61	43.18	50.01	74.00	-23.99	Peak	



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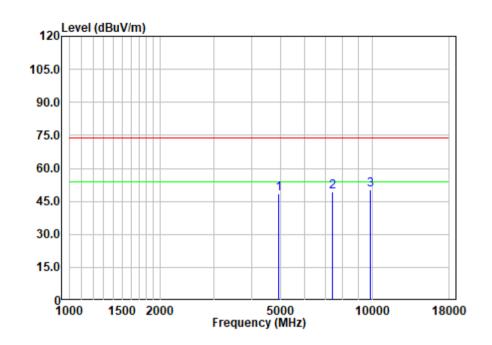
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	_							
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	0.00	41.69	47.83	48.50	74.00	-25.50	Peak
2	7386.000	0.00	42.44	45.76	49.33	74.00	-24.67	Peak
3	9848.000	0.00	42.43	43.25	50.43	74.00	-23.57	Peak



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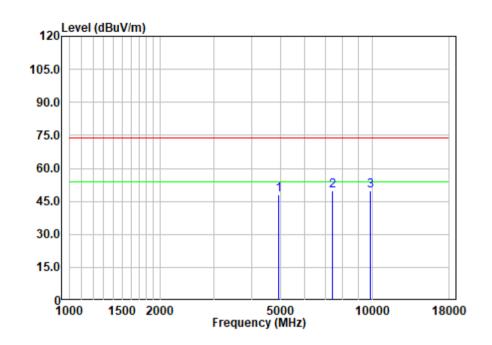
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Test Mode: 04; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
4924.000	0.00	41.69	47.38	48.05	74.00	-25.95	Peak	
7386.000	0.00	42.44	46.16	49.73	74.00	-24.27	Peak	
9848.000	0.00	42.43	42.83	50.01	74.00	-23.99	Peak	
	MHz 4924.000 7386.000	Freq Factor MHz dB 4924.000 0.00 7386.000 0.00	MHz dB dB 4924.000 0.00 41.69 7386.000 0.00 42.44	MHz dB dB dBuV 4924.000 0.00 41.69 47.38 7386.000 0.00 42.44 46.16	MHz dB dB dBuV dBuV/m 4924.000 0.00 41.69 47.38 48.05 7386.000 0.00 42.44 46.16 49.73	MHz dB dB dBuV dBuV/m dBuV/m	MHz dB dB dBuV dBuV/m dBuV/m dB 4924.000 0.00 41.69 47.38 48.05 74.00 -25.95 7386.000 0.00 42.44 46.16 49.73 74.00 -24.27	Freq Factor Factor Level Level Line Limit Remark MHz dB dB dBuV dBuV/m dBuV/m dB



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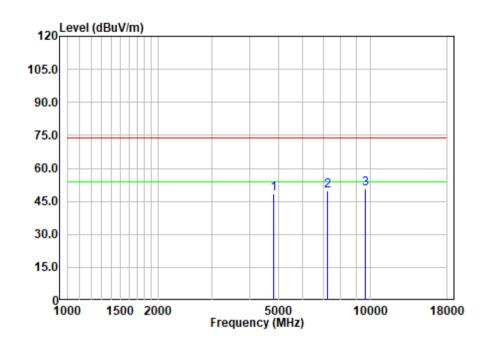
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	_							
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	0.00	42.24	48.52	48.59	74.00	-25.41	Peak
2	7236.000	0.00	42.61	46.39	49.59	74.00	-24.41	Peak
3	9648.000	0.00	42.32	43.76	50.72	74.00	-23.28	Peak



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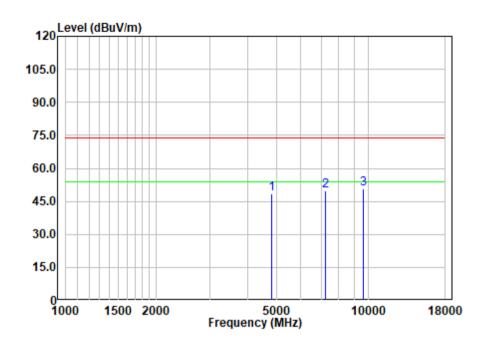
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Test Mode: 04; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	_							
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	0.00	42.24	48.17	48.24	74.00	-25.76	Peak
2	7236.000	0.00	42.61	46.74	49.94	74.00	-24.06	Peak
3	9648.000	0.00	42.32	43.76	50.72	74.00	-23.28	Peak



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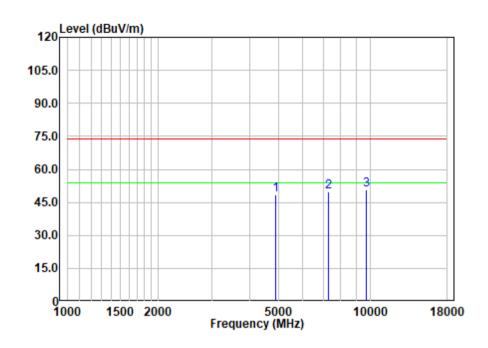
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	0.00	41.92	47.90	48.32	74.00	-25.68	Peak
2	7311.000	0.00	42.50	46.52	49.92	74.00	-24.08	Peak
3	9748.000	0.00	42.61	44.10	50.93	74.00	-23.07	Peak



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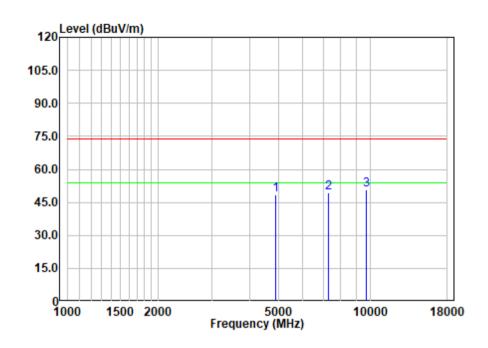
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Test Mode: 04; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	•								
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	4874.000	0.00	41.92	48.23	48.65	74.00	-25.35	Peak	
2	7311.000	0.00	42.50	46.11	49.51	74.00	-24.49	Peak	
3	9748.000	0.00	42.61	43.81	50.64	74.00	-23.36	Peak	



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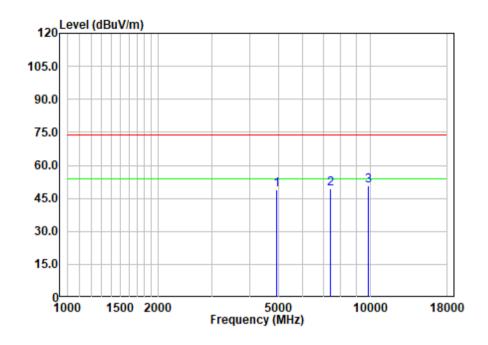
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver		
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	4924.000	0.00	41.69	48.03	48.70	74.00	-25.30	Peak	
2	7386.000	0.00	42.44	45.64	49.21	74.00	-24.79	Peak	
3	9848.000	0.00	42.43	43.56	50.74	74.00	-23.26	Peak	



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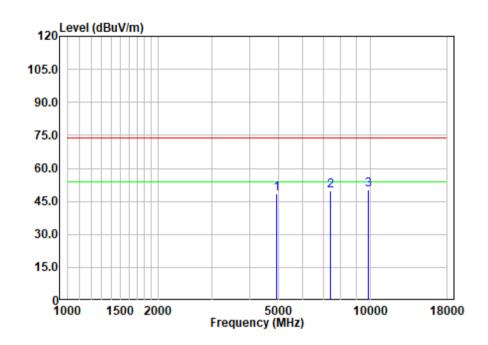
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Test Mode: 04; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	_							
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	0.00	41.69	48.00	48.67	74.00	-25.33	Peak
2	7386.000	0.00	42.44	46.04	49.61	74.00	-24.39	Peak
3	9848.000	0.00	42.43	42.86	50.04	74.00	-23.96	Peak



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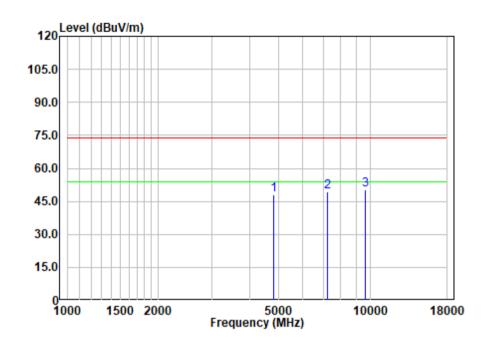
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
4824.000	0.00	42.24	47.94	48.01	74.00	-25.99	Peak	
7236.000	0.00	42.61	46.22	49.42	74.00	-24.58	Peak	
9648.000	0.00	42.32	43.10	50.06	74.00	-23.94	Peak	
	MHz 4824.000 7236.000	Freq Factor MHz dB 4824.000 0.00 7236.000 0.00	MHz dB dB 4824.000 0.00 42.24 7236.000 0.00 42.61	MHz dB dB dBuV 4824.000 0.00 42.24 47.94 7236.000 0.00 42.61 46.22	MHz dB dB dBuV dBuV/m 4824.000 0.00 42.24 47.94 48.01 7236.000 0.00 42.61 46.22 49.42	MHz dB dB dBuV dBuV/m dBuV/m 4824.000 0.00 42.24 47.94 48.01 74.00 7236.000 0.00 42.61 46.22 49.42 74.00	MHz dB dB dBuV dBuV/m dBuV/m dB 4824.000 0.00 42.24 47.94 48.01 74.00 -25.99 7236.000 0.00 42.61 46.22 49.42 74.00 -24.58	Freq Factor Factor Level Level Line Limit Remark



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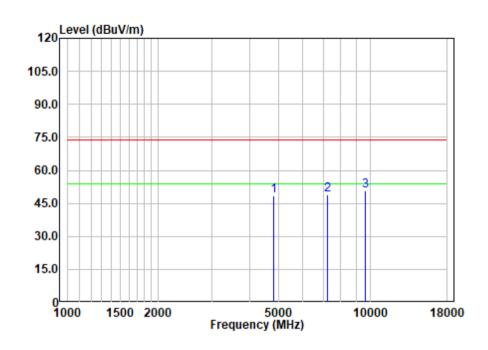
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	_							
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	0.00	42.24	48.58	48.65	74.00	-25.35	Peak
2	7236.000	0.00	42.61	45.91	49.11	74.00	-24.89	Peak
3	9648.000	0.00	42.32	43.70	50.66	74.00	-23.34	Peak



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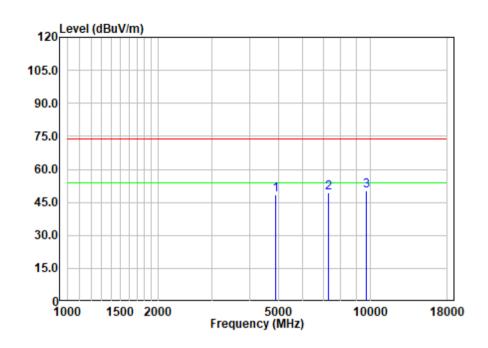
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



	Aux	Preamp	Read		Limit	0ver		
Freq	Factor	Factor	Level	Level	Line	Limit	Remark	
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
4874.000	0.00	41.92	48.25	48.67	74.00	-25.33	Peak	
7311.000	0.00	42.50	45.95	49.35	74.00	-24.65	Peak	
9748.000	0.00	42.61	43.24	50.07	74.00	-23.93	Peak	
	MHz 4874.000 7311.000	Freq Factor MHz dB 4874.000 0.00 7311.000 0.00	MHz dB dB 4874.000 0.00 41.92 7311.000 0.00 42.50	MHz dB dB dBuV 4874.000 0.00 41.92 48.25 7311.000 0.00 42.50 45.95	MHz dB dB dBuV dBuV/m 4874.000 0.00 41.92 48.25 48.67 7311.000 0.00 42.50 45.95 49.35	MHz dB dB dBuV dBuV/m dBuV/m 4874.000 0.00 41.92 48.25 48.67 74.00 7311.000 0.00 42.50 45.95 49.35 74.00	MHz dB dB dBuV dBuV/m dBuV/m dB 4874.000 0.00 41.92 48.25 48.67 74.00 -25.33 7311.000 0.00 42.50 45.95 49.35 74.00 -24.65	Freq Factor Factor Level Level Line Limit Remark



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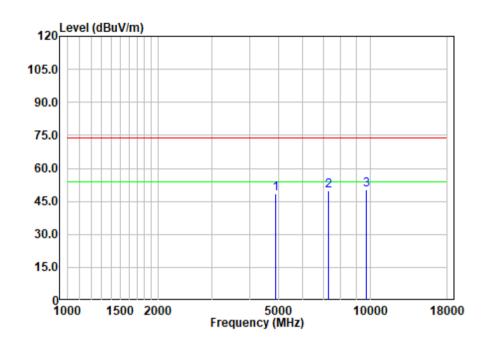
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	0.00	41.92	47.92	48.34	74.00	-25.66	Peak
2	7311.000	0.00	42.50	46.35	49.75	74.00	-24.25	Peak
3	9748.000	0.00	42.61	43.28	50.11	74.00	-23.89	Peak



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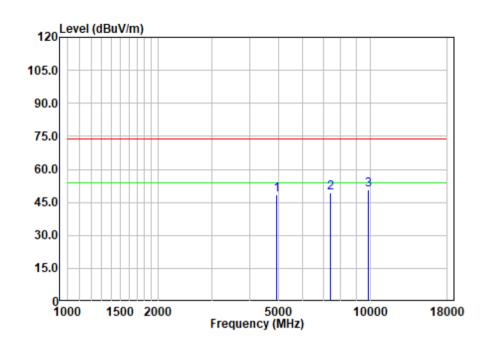
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	0.00	41.69	47.76	48.43	74.00	-25.57	Peak
2	7386.000	0.00	42.44	45.59	49.16	74.00	-24.84	Peak
3	9848.000	0.00	42.43	43.58	50.76	74.00	-23.24	Peak



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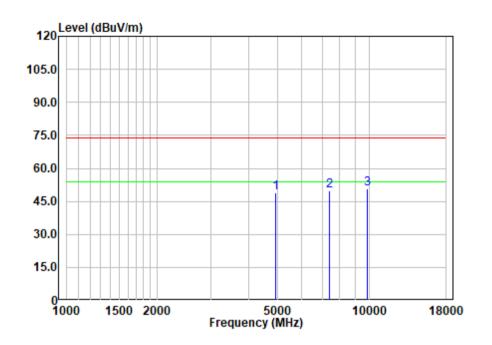
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	0.00	41.69	48.26	48.93	74.00	-25.07	Peak
2	7386.000	0.00	42.44	46.32	49.89	74.00	-24.11	Peak
3	9848.000	0.00	42.43	43.51	50.69	74.00	-23.31	Peak



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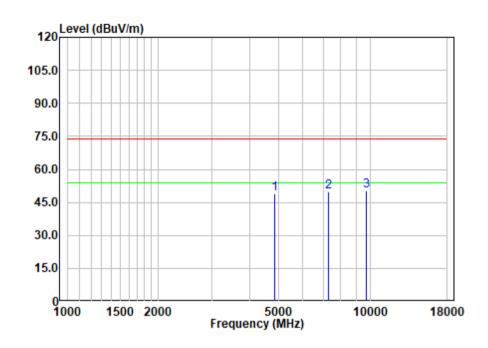
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4844.000	0.00	42.11	48.78	49.00	74.00	-25.00	Peak
2	7266.000	0.00	42.56	46.49	49.78	74.00	-24.22	Peak
3	9688.000	0.00	42.64	43.51	50.21	74.00	-23.79	Peak



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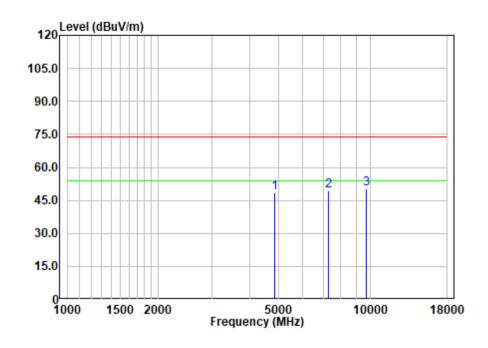
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



	Aux	Preamp	Read		Limit	0ver	
Freq	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
4844.000	0.00	42.11	48.01	48.23	74.00	-25.77	Peak
7266.000	0.00	42.56	46.09	49.38	74.00	-24.62	Peak
9688.000	0.00	42.64	43.69	50.39	74.00	-23.61	Peak
	MHz 4844.000 7266.000	Freq Factor MHz dB 4844.000 0.00 7266.000 0.00	MHz dB dB 4844.000 0.00 42.11 7266.000 0.00 42.56	MHz dB dB dBuV 4844.000 0.00 42.11 48.01 7266.000 0.00 42.56 46.09	MHz dB dB dBuV dBuV/m 4844.000 0.00 42.11 48.01 48.23 7266.000 0.00 42.56 46.09 49.38	MHz dB dB dBuV dBuV/m dBuV/m dBuV/m 4844.000 0.00 42.11 48.01 48.23 74.00 7266.000 0.00 42.56 46.09 49.38 74.00	Aux Preamp Read Limit Over Freq Factor Factor Level Level Line Limit MHz dB dB dB dBuV dBuV/m dBuV/m dB 4844.000 0.00 42.11 48.01 48.23 74.00 -25.77 7266.000 0.00 42.56 46.09 49.38 74.00 -24.62 9688.000 0.00 42.64 43.69 50.39 74.00 -23.61



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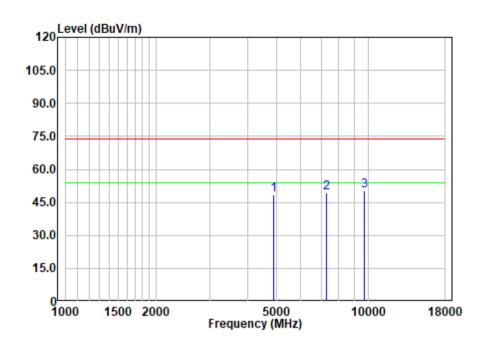
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	0.00	41.92	48.23	48.65	74.00	-25.35	Peak
2	7311.000	0.00	42.50	46.17	49.57	74.00	-24.43	Peak
3	9748.000	0.00	42.61	43.58	50.41	74.00	-23.59	Peak



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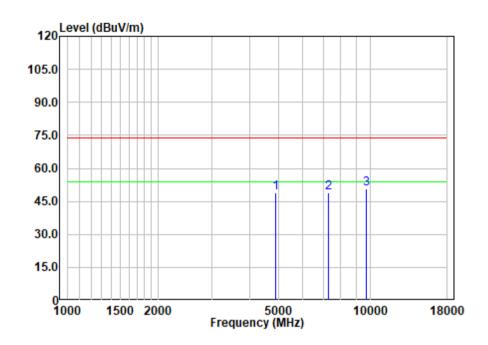
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	0.00	41.92	48.45	48.87	74.00	-25.13	Peak
2	7311.000	0.00	42.50	45.69	49.09	74.00	-24.91	Peak
3	9748.000	0.00	42.61	43.87	50.70	74.00	-23.30	Peak



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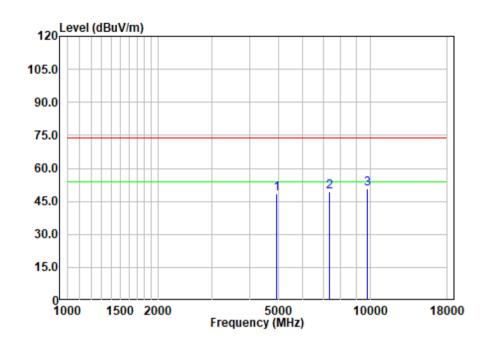
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Test Mode: 04; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	_							
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4904.000	0.00	41.74	47.78	48.39	74.00	-25.61	Peak
2	7356.000	0.00	42.47	45.95	49.45	74.00	-24.55	Peak
3	9808.000	0.00	42.45	43.48	50.58	74.00	-23.42	Peak



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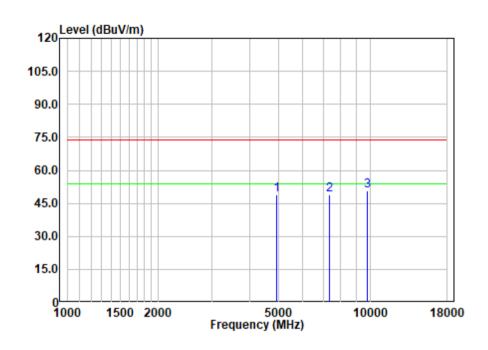
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Test Mode: 04; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



		Aux	Preamp	Read		Limit	0ver	
	Freq	Factor	Factor	Level	Level	Line	Limit	Remark
	_							
	MHz	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4904.000	0.00	41.74	48.31	48.92	74.00	-25.08	Peak
2	7356.000	0.00	42.47	45.60	49.10	74.00	-24.90	Peak
3	9808.000	0.00	42.45	43.76	50.86	74.00	-23.14	Peak



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2208001383AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2208001383AT



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10 Appendix

Appendix for KSCR2208001383AT

1. Duty Cycle

1.1 Ant1

1.1.1 Test Result

Ant1									
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)		
	SISO	2412	100.000	100.000	100.00	0.00	0.00		
802.11b		2437	100.000	100.000	100.00	0.00	0.00		
		2462	100.000	100.000	100.00	0.00	0.00		
		2412	100.000	100.000	100.00	0.00	0.00		
802.11g	SISO	2437	100.000	100.000	100.00	0.00	0.00		
		2462	100.000	100.000	100.00	0.00	0.00		
000.44	MIMO	2412	100.000	100.000	100.00	0.00	0.00		
802.11n (HT20)		2437	100.000	100.000	100.00	0.00	0.00		
(11120)		2462	100.000	100.000	100.00	0.00	0.00		
000.44	MIMO	2422	100.000	100.000	100.00	0.00	0.00		
802.11n (HT40)		2437	100.000	100.000	100.00	0.00	0.00		
(11140)		2452	100.000	100.000	100.00	0.00	0.00		



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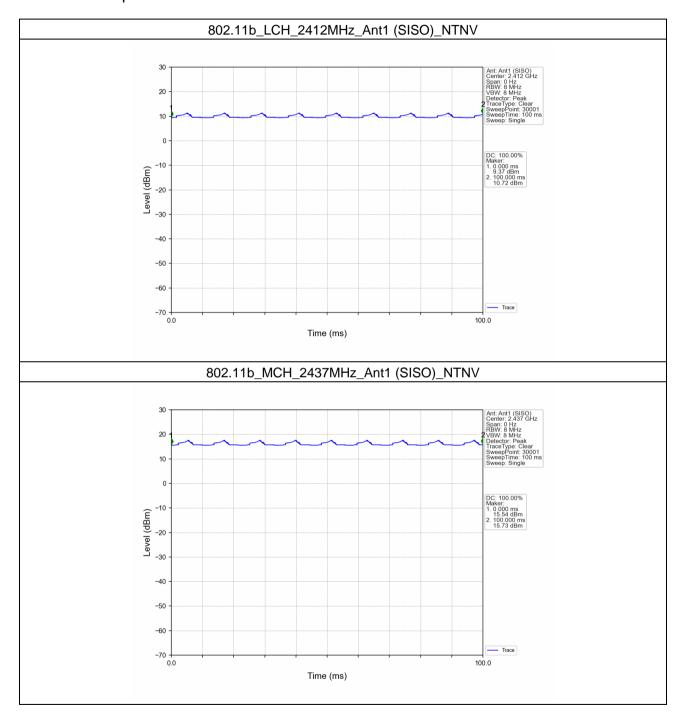
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1.1.2 Test Graph





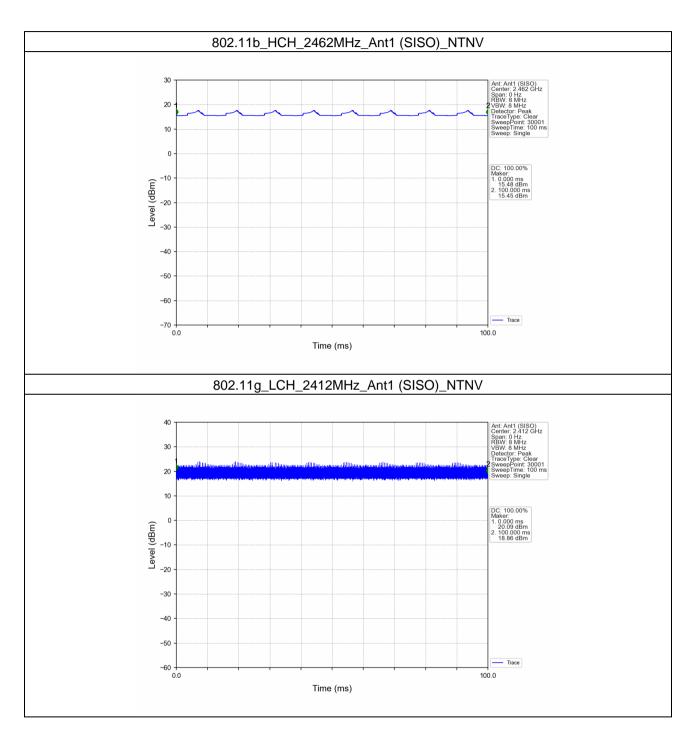
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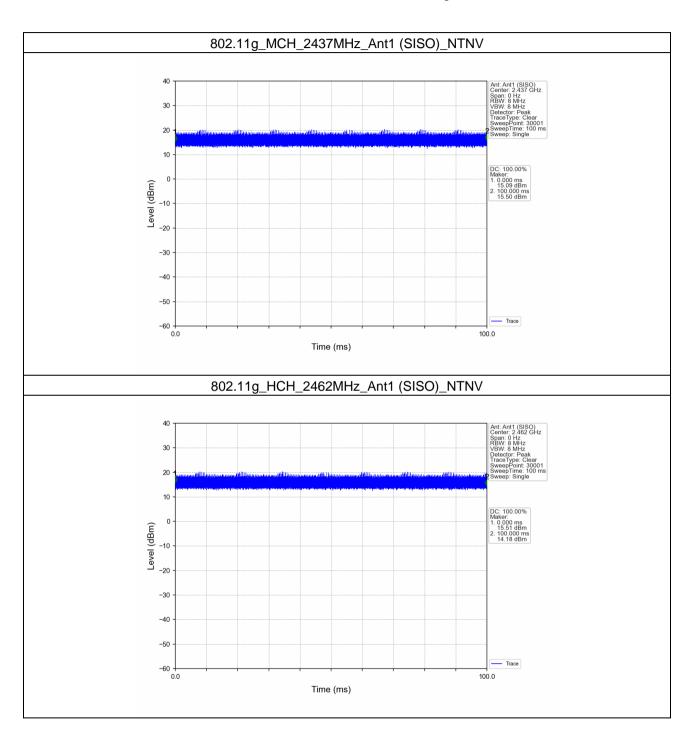
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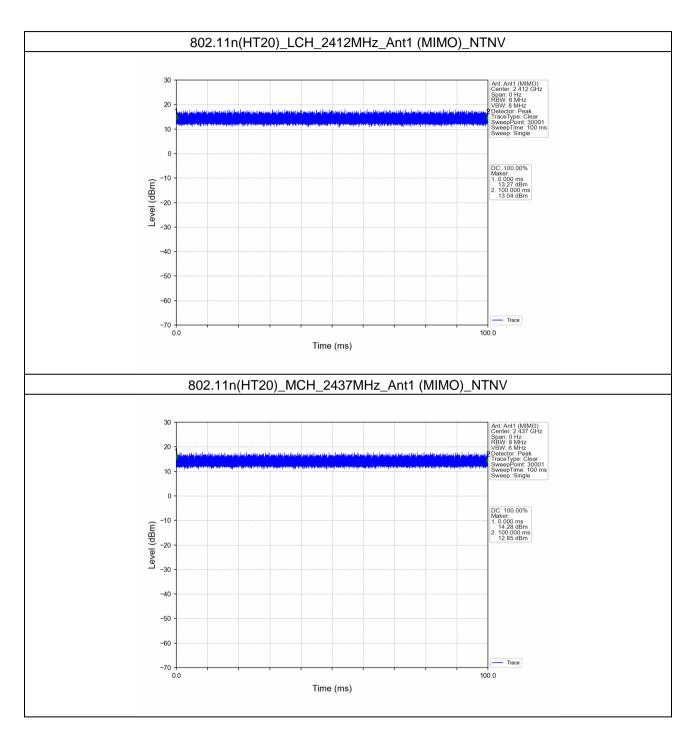
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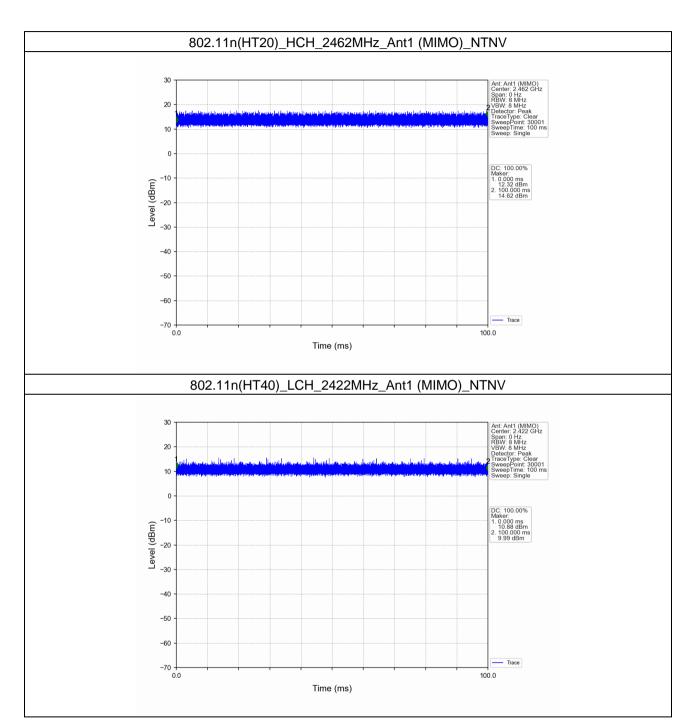
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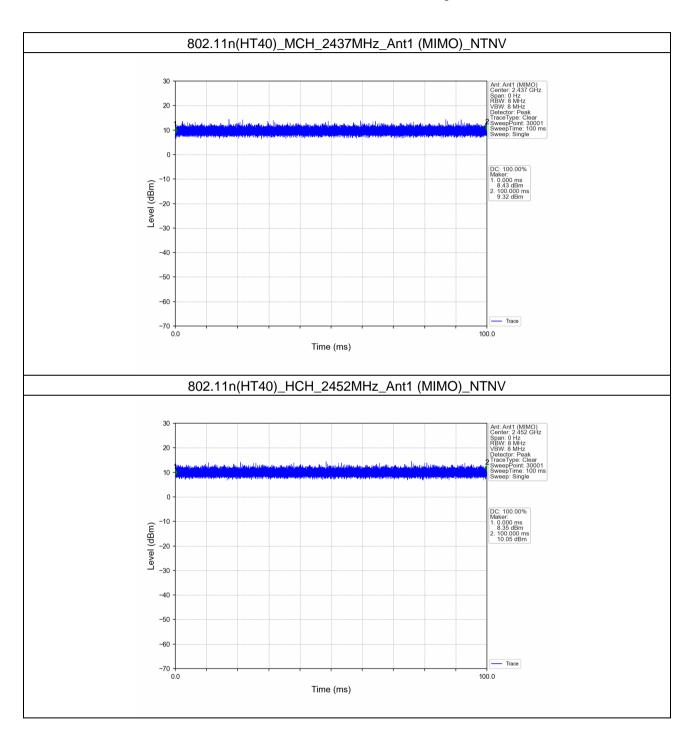
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2. Bandwidth

2.1 OBW

2.1.1 Test Result

NA. J.	TX	Frequency (MHz)	ANIT	99% Occupied Bandwidth (MHz)	Verdict
Mode	Туре		ANT	Result	
		0.440	1	14.534	Pass
	SISO	2412	2	14.540	Pass
802.11b		2437	1	14.572	Pass
802.110			2	14.524	Pass
		2462	1	14.596	Pass
		2462	2	14.539	Pass
		2412	1	17.156	Pass
			2	16.944	Pass
802.11g	SISO	2437	1	17.109	Pass
802.11g	3130		2	16.846	Pass
		2462	1	17.115	Pass
			2	16.847	Pass
	MIMO	2412	1	18.224	Pass
			2	18.212	Pass
802.11n		2437	1	18.218	Pass
(HT20)			2	18.241	Pass
		2462	1	18.224	Pass
			2	18.238	Pass
	MIMO	2422	1	36.478	Pass
			2	36.426	Pass
802.11n		2437	1	36.477	Pass
(HT40)			2	36.412	Pass
		2452	1	36.455	Pass
			2	36.416	Pass



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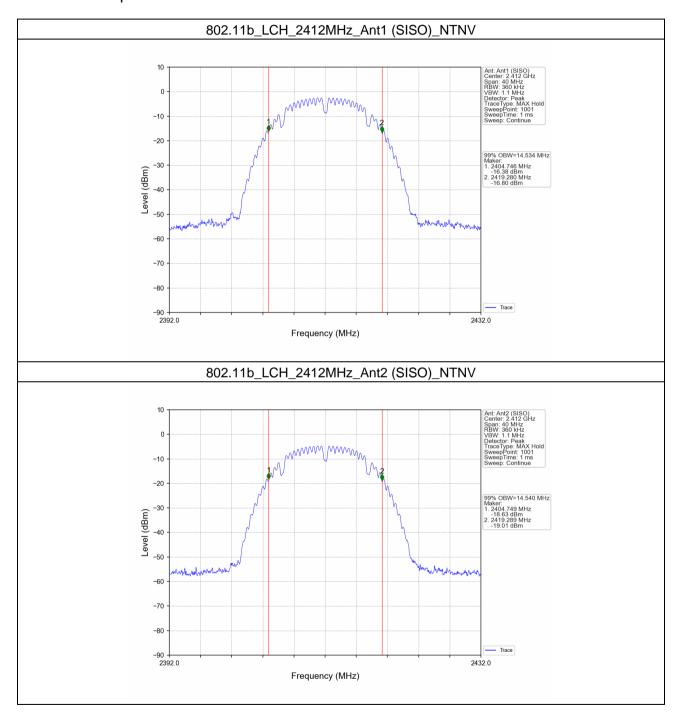
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2.1.2 Test Graph





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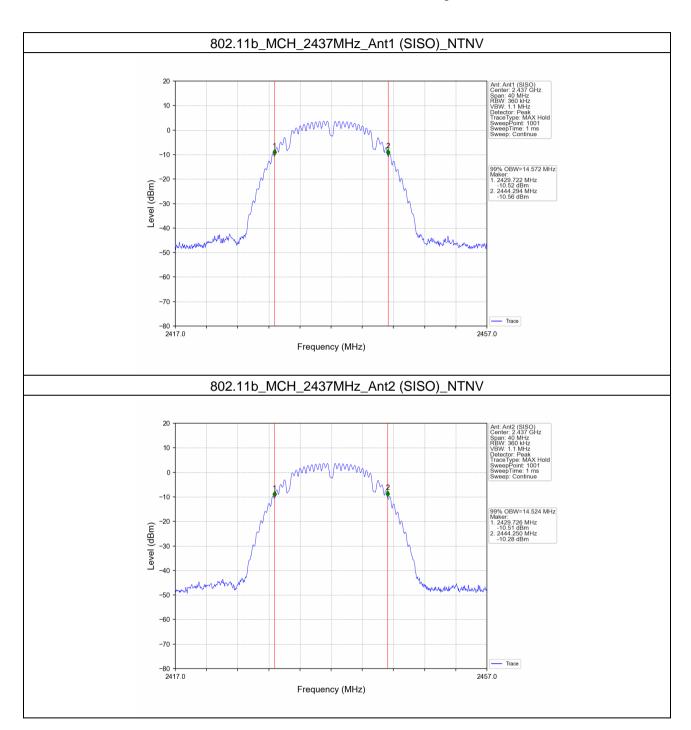
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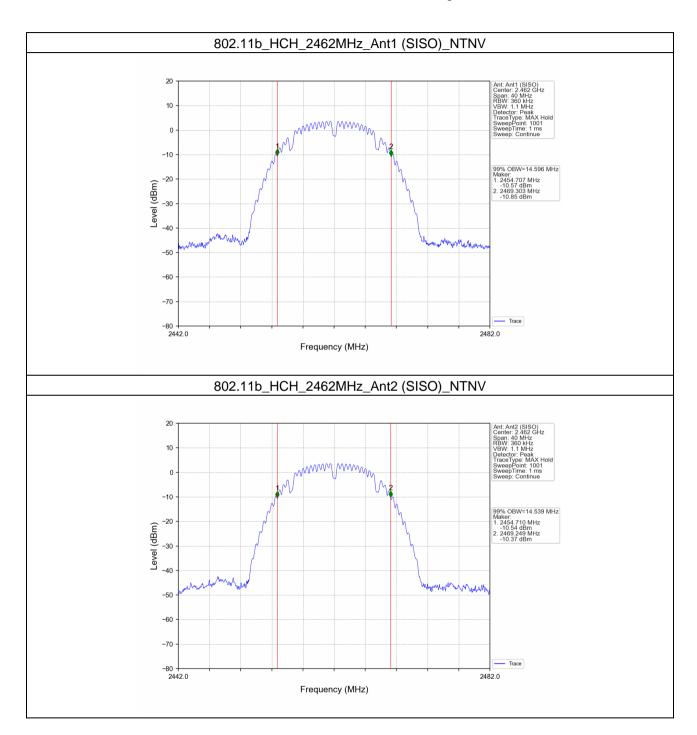
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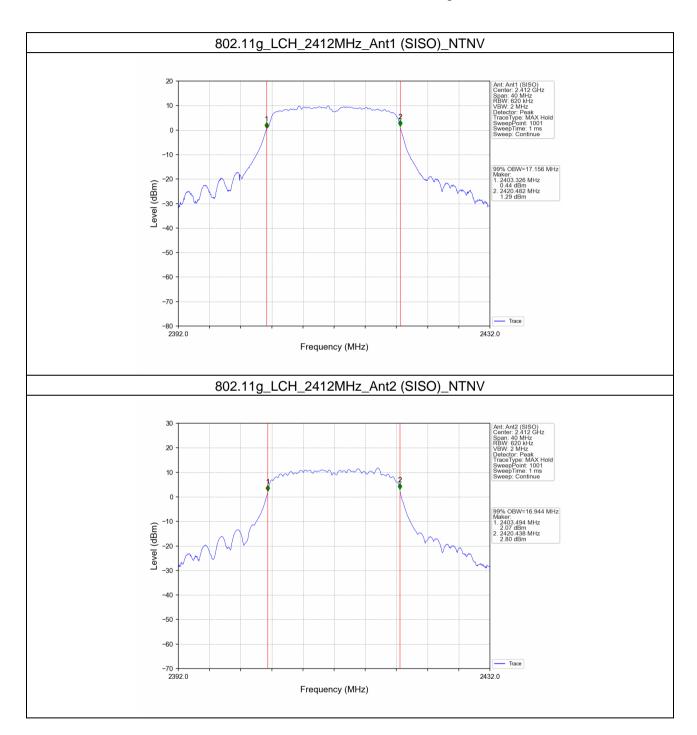
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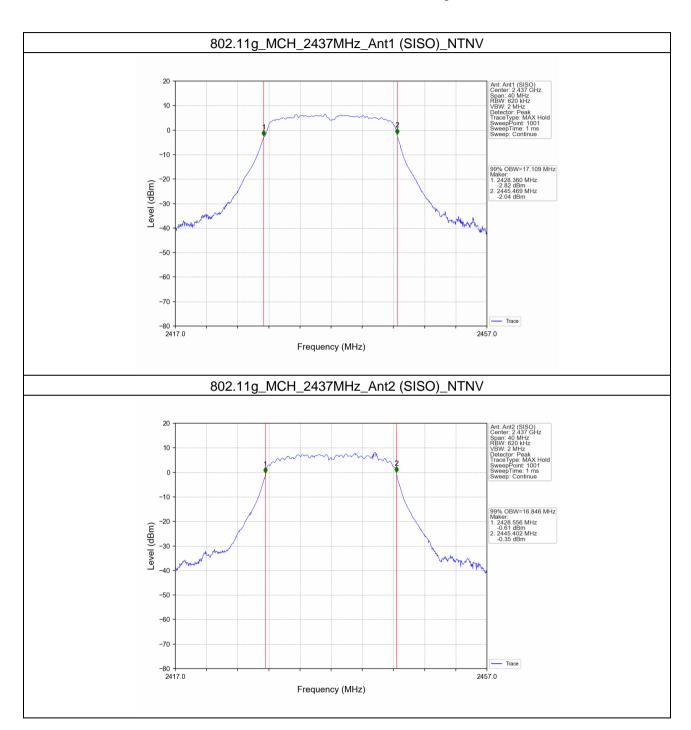
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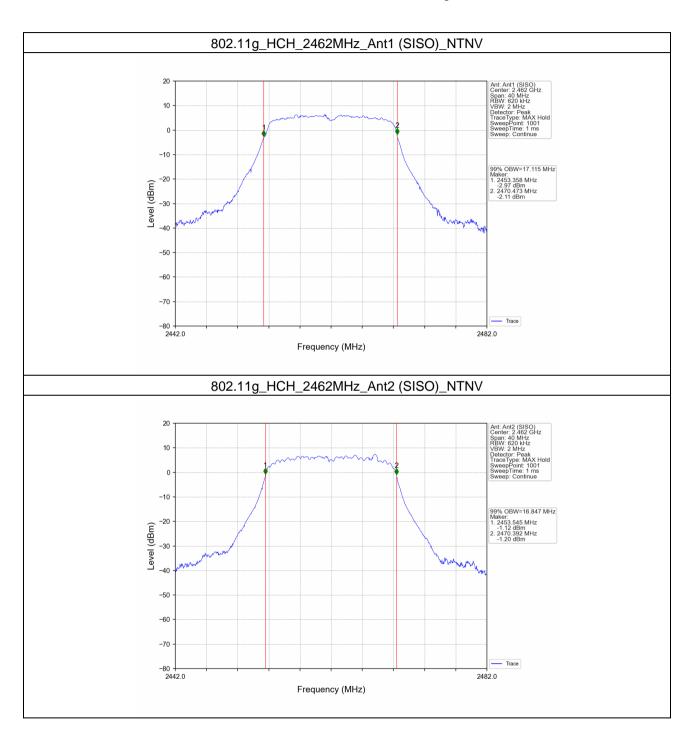
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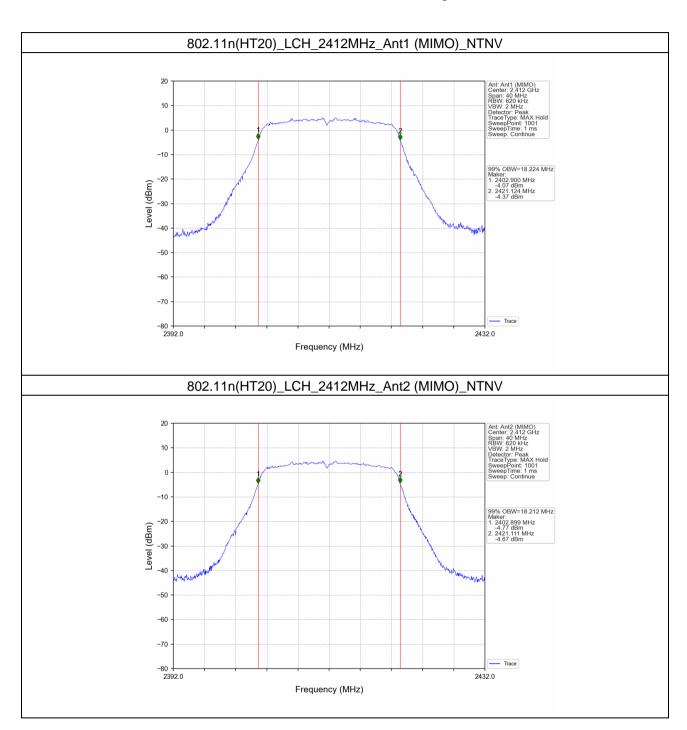
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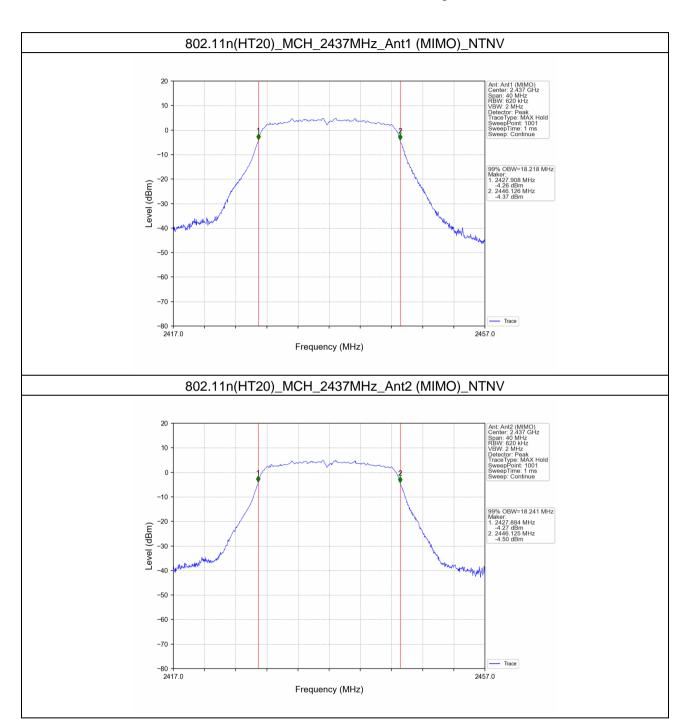
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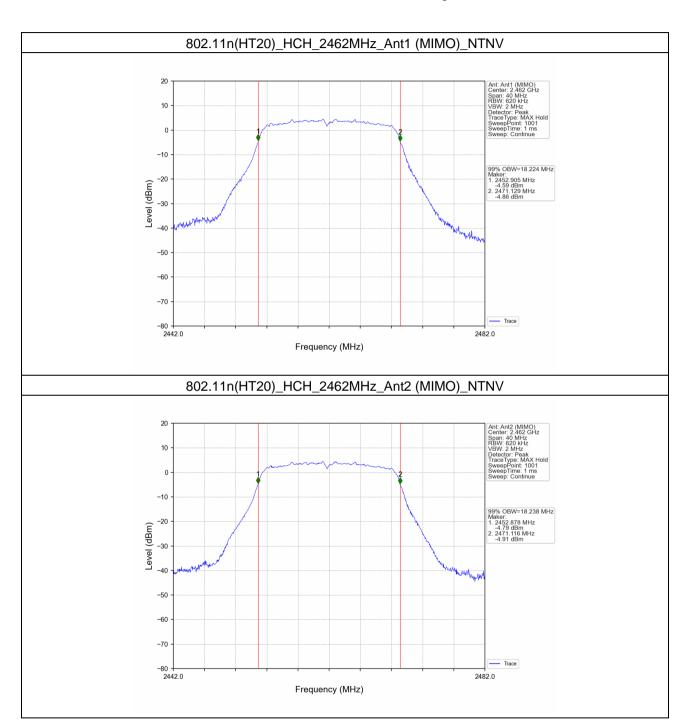
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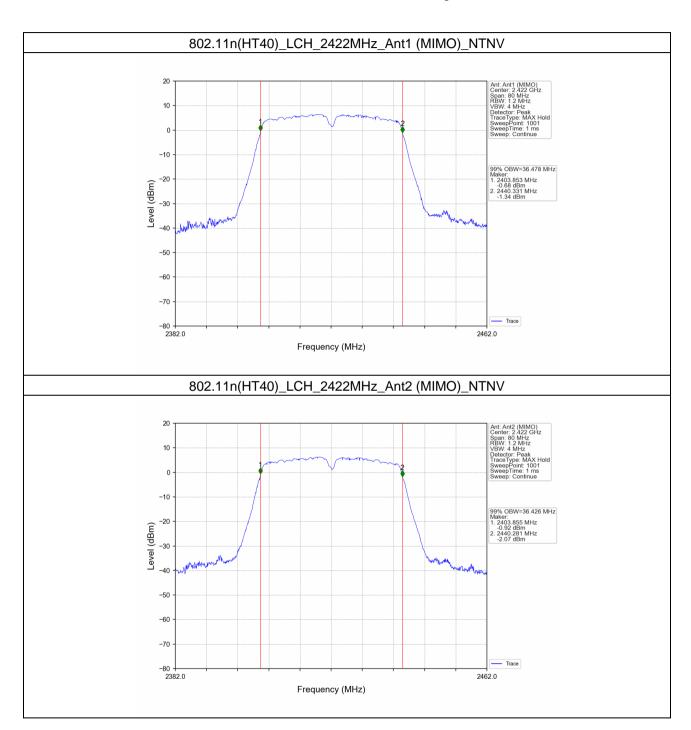
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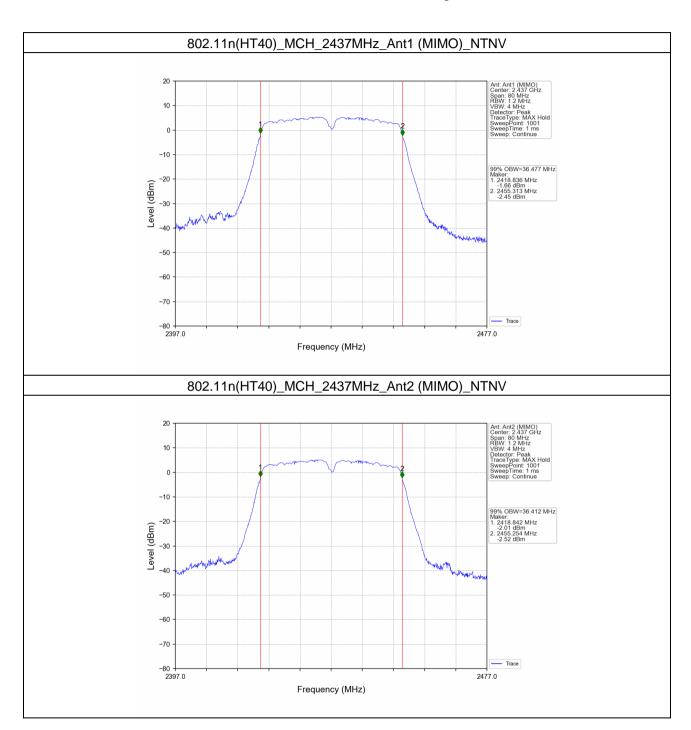
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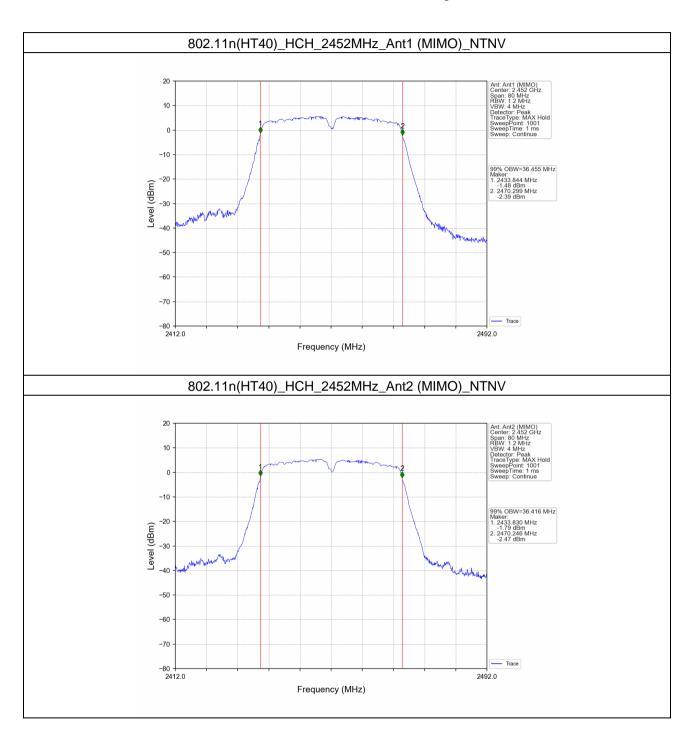
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2.2 6dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandy	Mandiat	
Mode			ANI	Result	Limit	Verdict
		0440	1 10.170	>=0.5	Pass	
		2412	2	10.168	>=0.5	Pass
000 445	SISO	0407	1	10.170	>=0.5	Pass
802.11b		2437	2	10.168	>=0.5	Pass
		2462	1	10.170	>=0.5	Pass
			2	10.167	>=0.5	Pass
		2412	1 16.455		>=0.5	Pass
		2412	2	16.443	>=0.5	Pass
002.44~	SISO	2437	1	16.455	>=0.5	Pass
802.11g	5150	2437	2	16.443	>=0.5	Pass
		0.400	1	16.457	>=0.5	Pass
		2462	2	16.442	>=0.5	Pass
	MIMO	2412	1	17.647	>=0.5	Pass
		2412	2412 2	17.652	>=0.5	Pass
802.11n		2437	1	17.650	>=0.5	Pass
(HT20)			2	17.643	>=0.5	Pass
		2462	1	17.656	>=0.5	Pass
			2	17.643	>=0.5	Pass
	МІМО	2422	1	36.424	>=0.5	Pass
		2422	2	36.407	>=0.5 F	
802.11n		2427	1	36.439	>=0.5	Pass
(HT40)		2437 2 36.424 >=0.		>=0.5	Pass	
		2452	1	36.423	>=0.5	Pass
		2402	2 36.425	36.425	>=0.5	Pass



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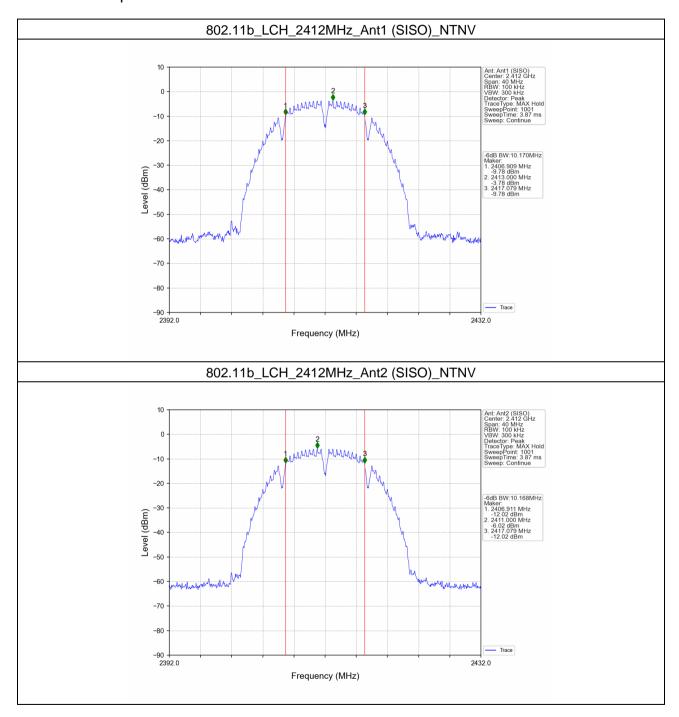
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2.2.2 Test Graph





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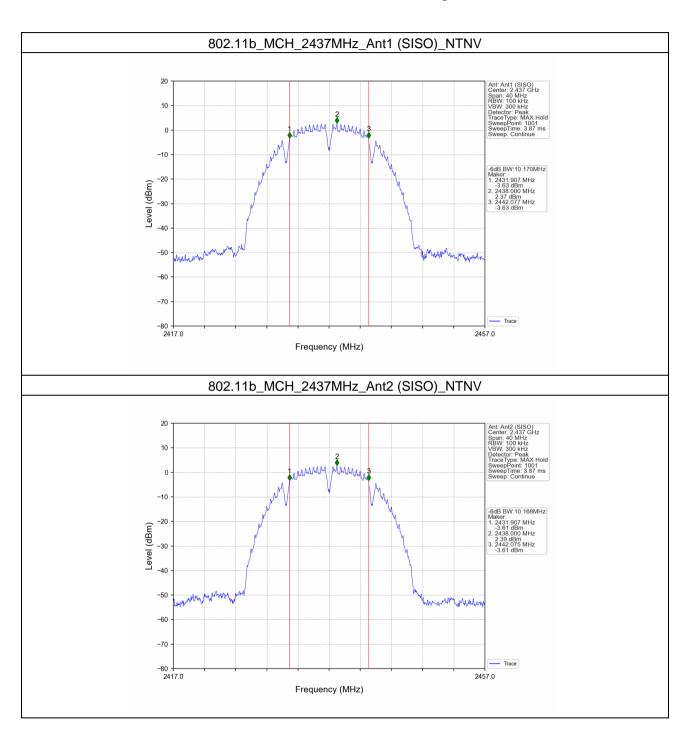
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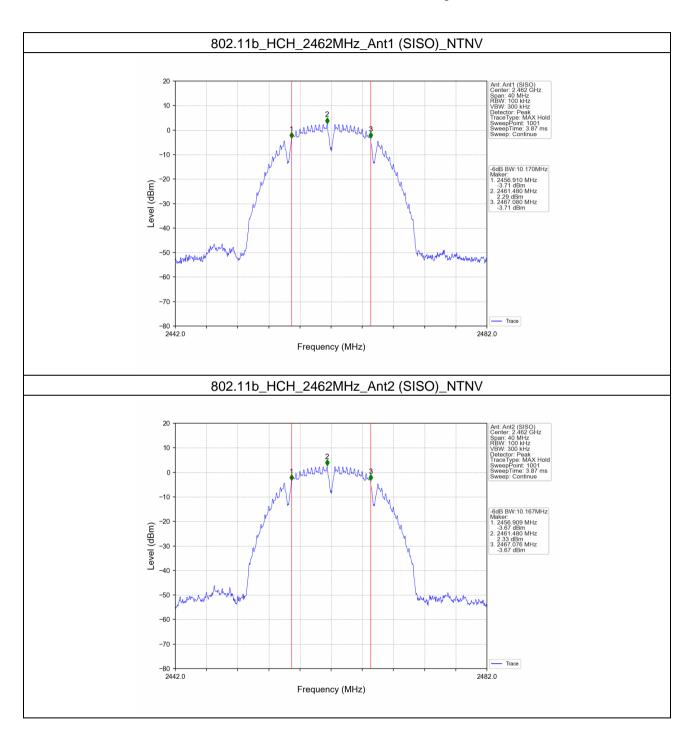
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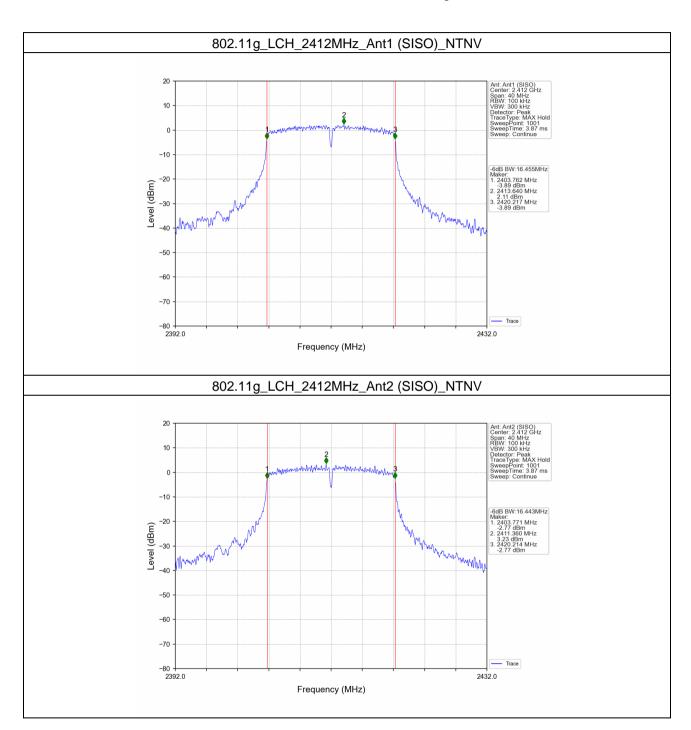
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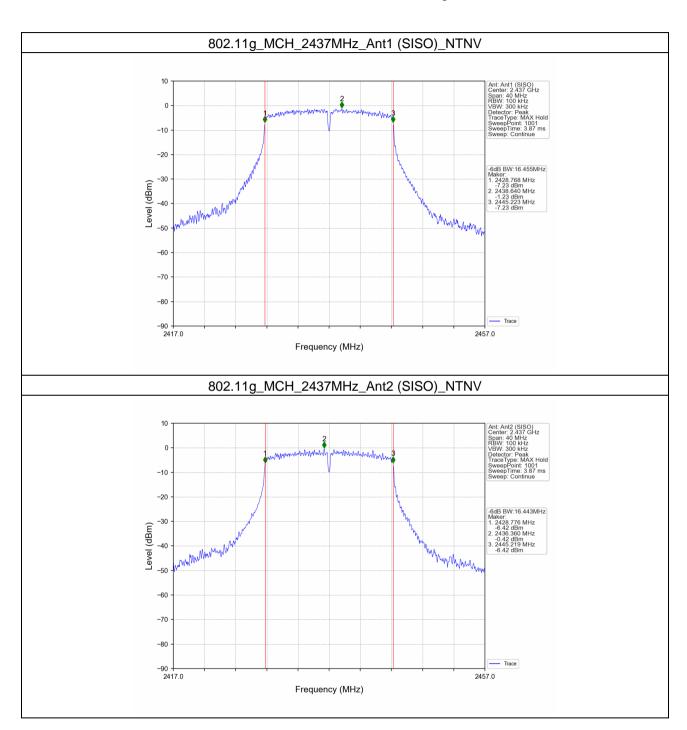
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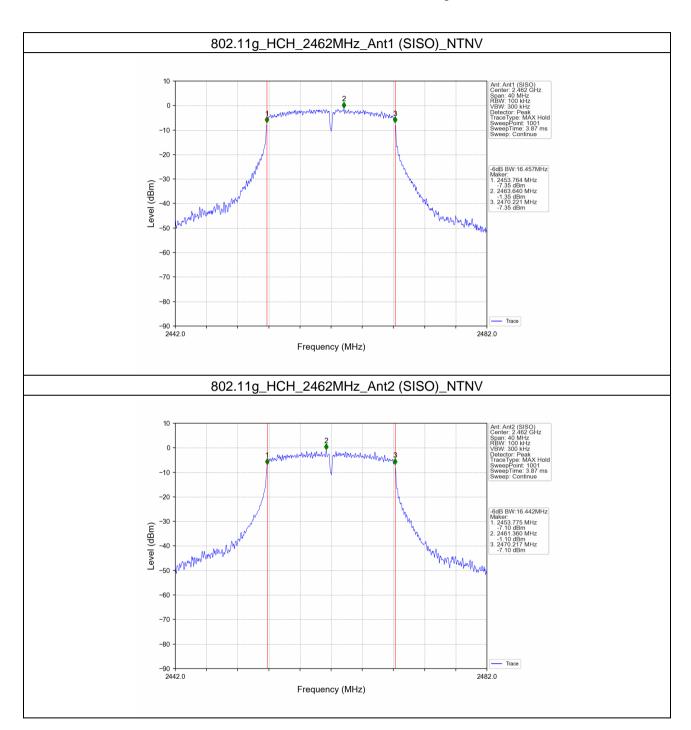
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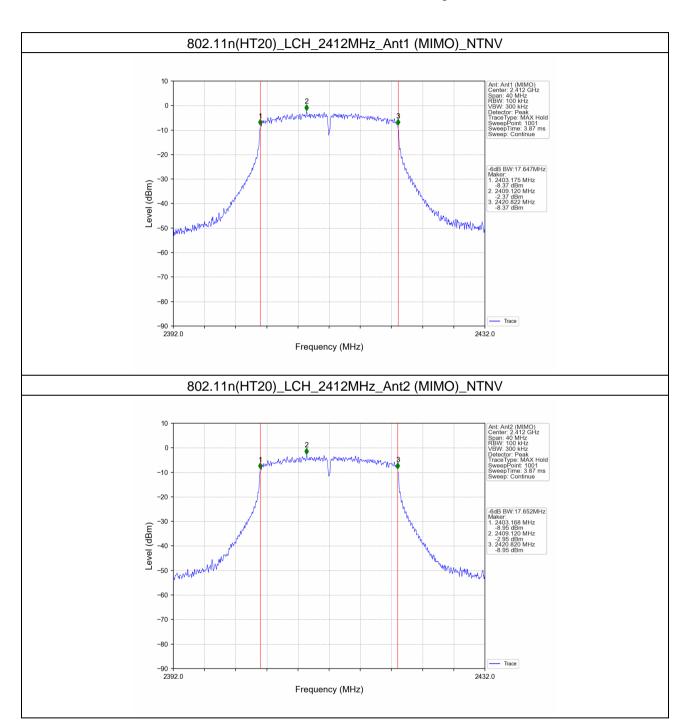
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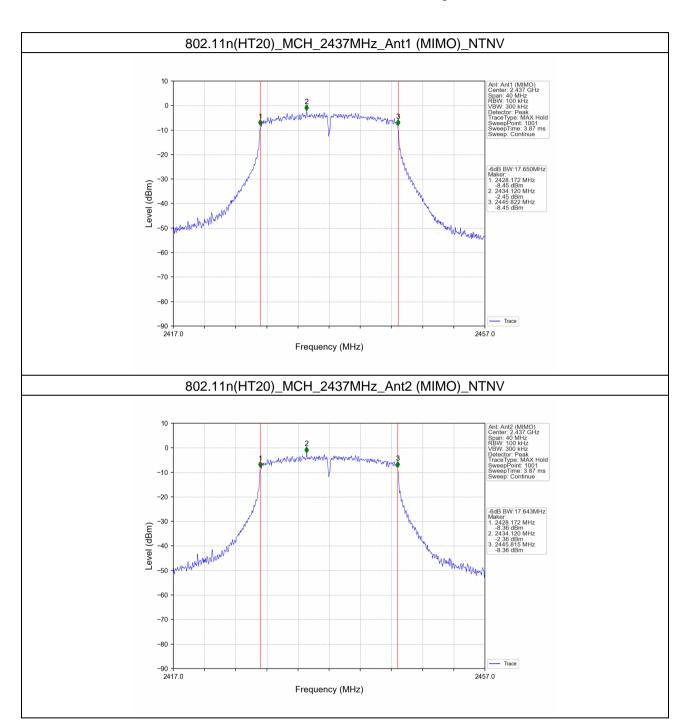
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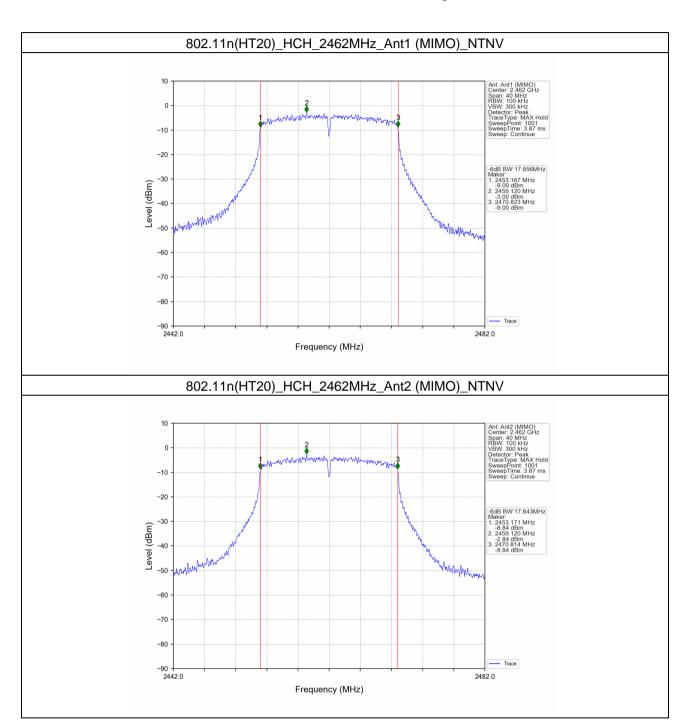
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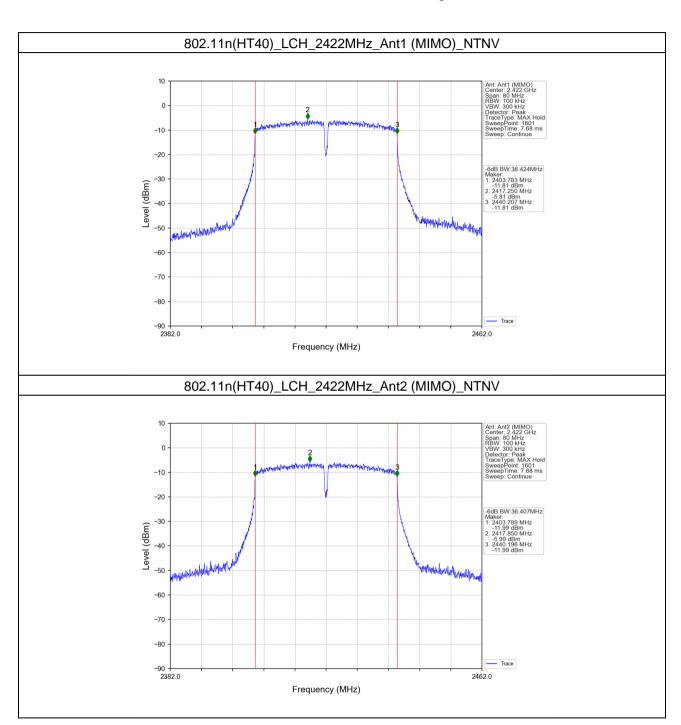
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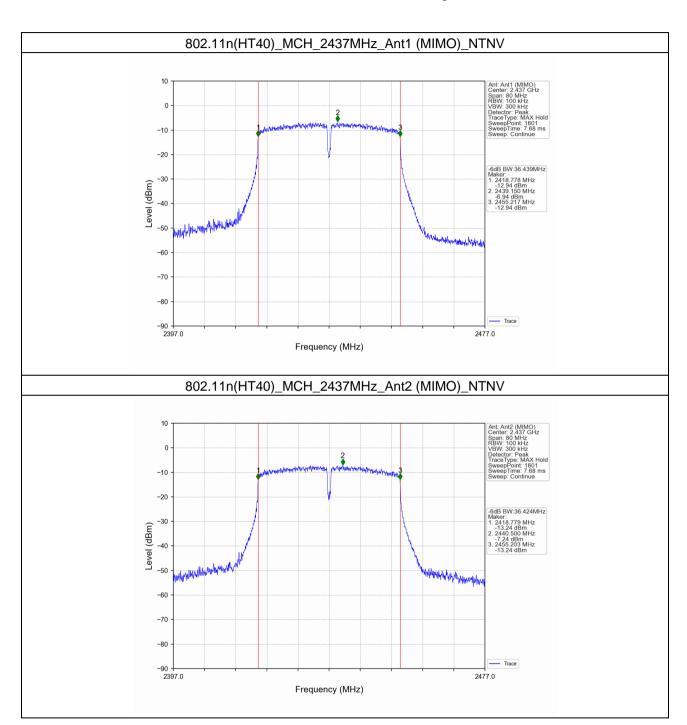
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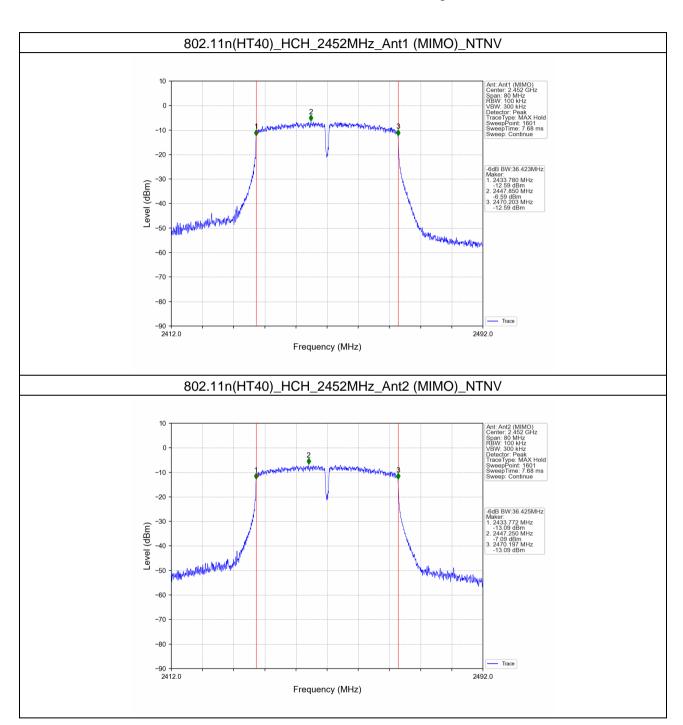
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3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)				\/a rdiat
			ANT1	ANT2	MIMO	Limit	Verdict
802.11b	SISO	2412	13.39	13.56	/	<=30	Pass
		2437	13.23	13.69	/	<=30	Pass
		2462	13.69	13.62	/	<=30	Pass
802.11g	SISO	2412	13.45	13.41	/	<=30	Pass
		2437	13.69	13.41	/	<=30	Pass
		2462	13.73	13.22	/	<=30	Pass
802.11n (HT20)	MIMO	2412	10.94	10.56	13.76	<=28.56	Pass
		2437	10.83	10.87	13.86	<=28.56	Pass
		2462	10.45	10.38	13.43	<=28.56	Pass
802.11n (HT40)	MIMO	2422	10.81	10.35	13.60	<=28.56	Pass
		2437	10.22	10.65	13.45	<=28.56	Pass
		2452	11.03	10.52	13.79	<=28.56	Pass

Note1: Antenna Gain: Ant1: 4.43dBi; Ant2: 4.43dBi;

Note2: Directional Gain: 7.44dBi

3.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



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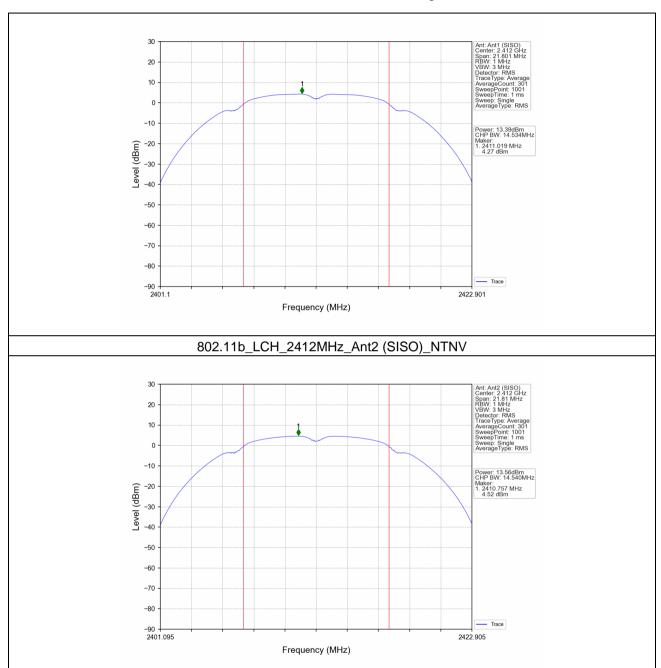
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802.11b MCH 2437MHz Ant1 (SISO) NTNV



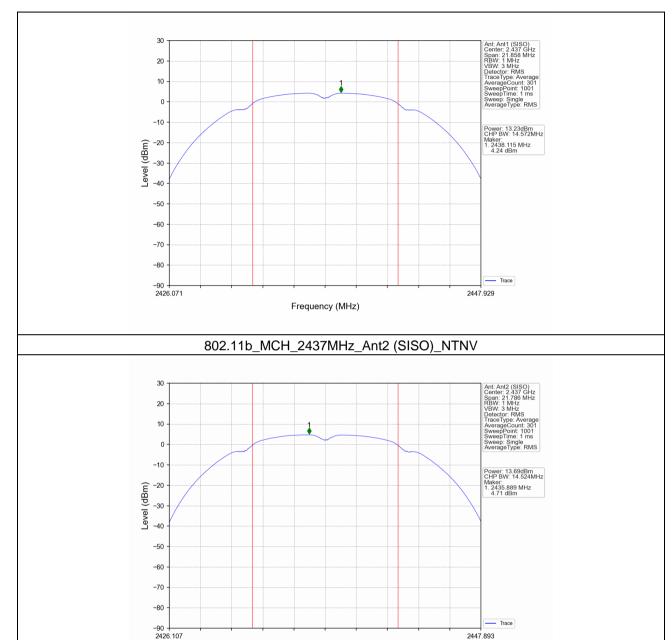
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Frequency (MHz)

802.11b HCH 2462MHz Ant1 (SISO) NTNV



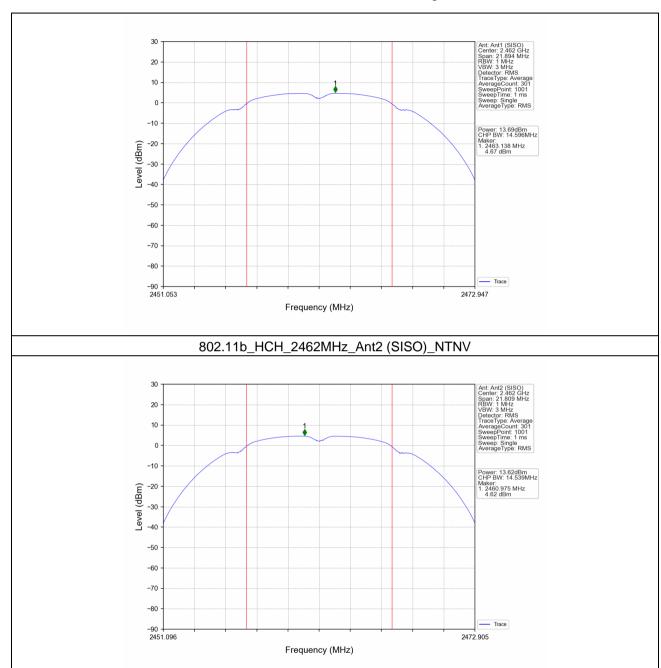
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802.11g LCH 2412MHz Ant1 (SISO) NTNV



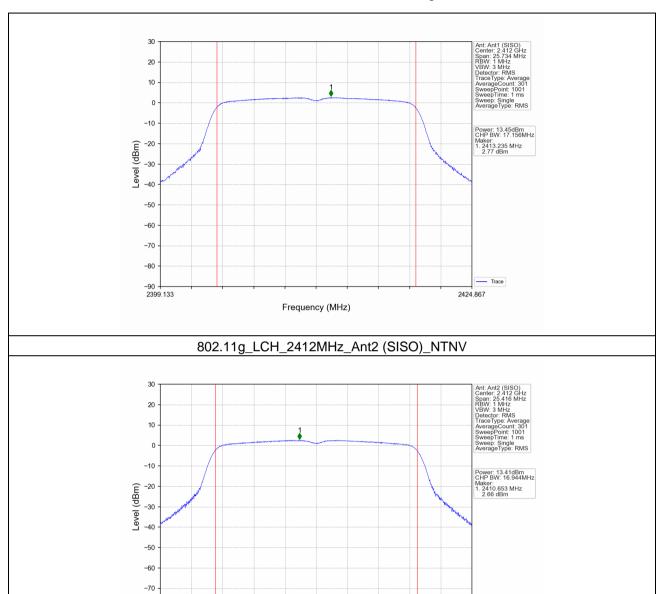
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Frequency (MHz)

802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



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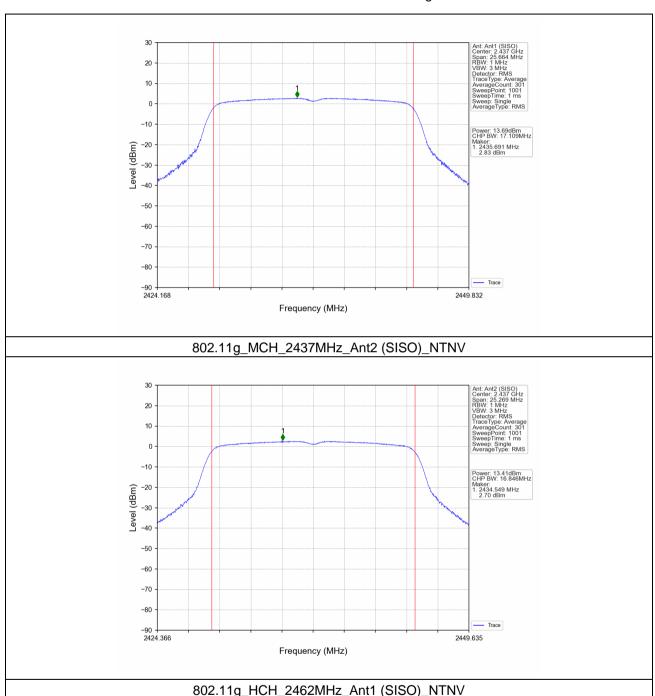
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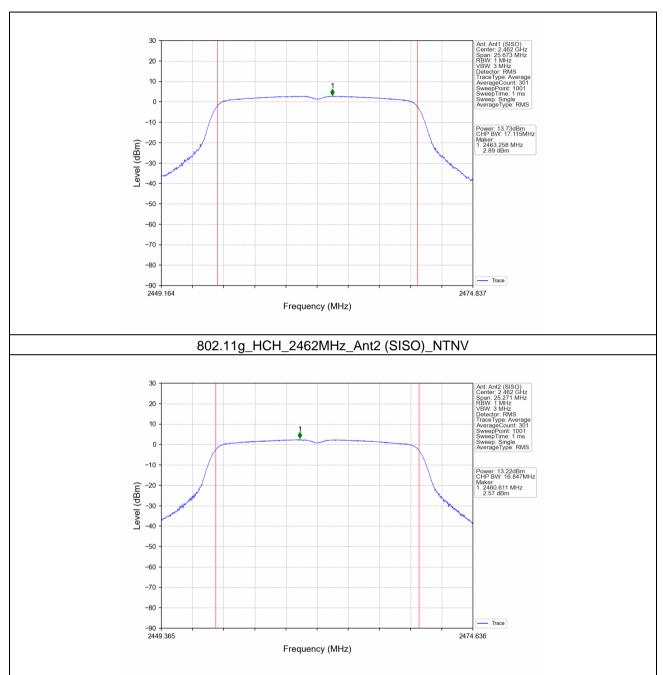
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802.11n(HT20) LCH 2412MHz Ant1 (MIMO) NTNV



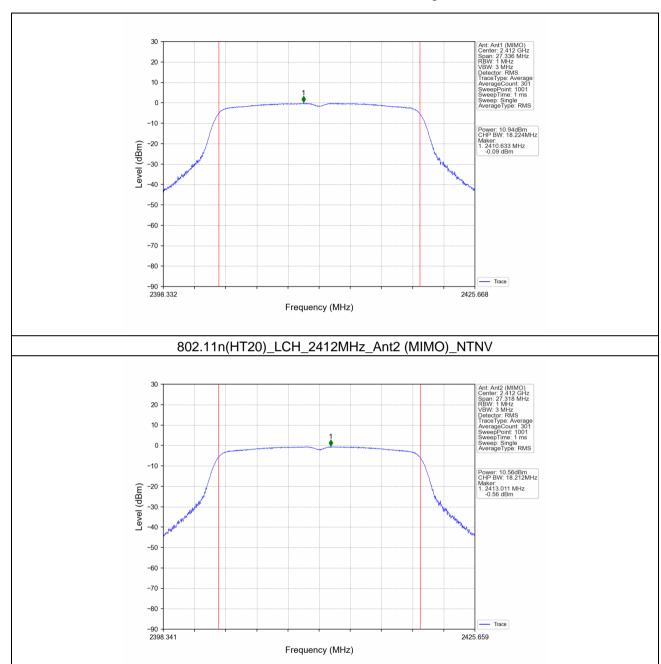
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802.11n(HT20) MCH 2437MHz Ant1 (MIMO) NTNV



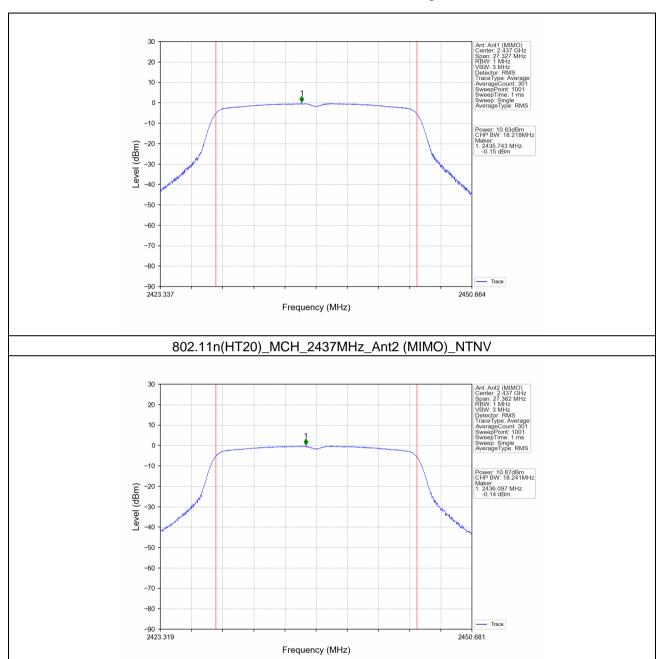
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802.11n(HT20) HCH 2462MHz Ant1 (MIMO) NTNV



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