TEST REPORT

Application No.:	KSCR2208001587AT
FCC ID:	2APV2-CSC6C1H3
Applicant:	Hangzhou Ezviz Software Co., Ltd.
Address of Applicant:	Room 302,Unit B,Building 2,399 Danfeng Road,Binjiang District,Hangzhou,Zhejiang
Manufacturer:	Hangzhou Ezviz Software Co., Ltd.
Address of Manufacturer:	Room 302,Unit B,Building 2,399 Danfeng Road,Binjiang District,Hangzhou,Zhejiang
Equipment Under Test (EUT):	
EUT Name:	Smart Home Camera
Model No.:	CS-C6c;CS-C6c (3WF,4mm);CS-C6c-R100-1H3WF ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	EZVIZ
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2022-09-01
Date of Test:	2022-09-03 to 2022-09-08
Date of Issue:	2022-09-08
Test Result:	**Pass***

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

Eric Lin
Laboratory Manager

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Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2022-09-08	/

Authorized for issue by:				
		Pawn.Liu/Project Engineer		
		Eric Lin /Reviewer		

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
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)	47 CFR Part 15, Subpart C 15.247	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		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		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

Note: There are series models mentioned in this report and they are identical on circuitry design, PCB layout, electrical components used, internal wiring and functions. Only the model CS-C6c (3WF,4mm) was tested since their differences are model number.

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3 Contents

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 5V,1A,5W MAX
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
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
Channel Spacing:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain:	3.83dBi (Provided by the manufacturer)
Test Voltage:	AC 120V/60Hz

4.2 Power level setting using in test:

Channel	802.11b	802.11g	802.11n(HT20)
	Ant 1	Ant 1	Ant 1
1	Default	Default	Default
6	Default	Default	Default
11	Default	Default	Default

4.3 Environment Parameter

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	25	AC 120

Note:

NV:Normal Voltage	LV:Low Extreme Test Voltage	HV:High Extreme Test Voltage
NT:Normal Temperature	LT:Low Extreme Test Temperature	HT:High Extreme Test Temperature

4.4 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	K27	EB24537645
SecureCRT	VanDyke	V 6.2.0	/
Serial port adapter plate	/	Test Plate 3	/
Adapter	Mingxin	MX15U-050300UU	/

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4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-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	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		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
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 Conducted 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 Radiated 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 is PCB Antenna on the main PCB and no consideration of replacement. The best case gain of the antenna is 3.83 dBi.

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 emission(MHz)	Conducted limit(dBμV)	
	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 (9kHz resolution bandwidth) 0.15M to 30MHz		

7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 24.3 °C Humidity: 41.8 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); 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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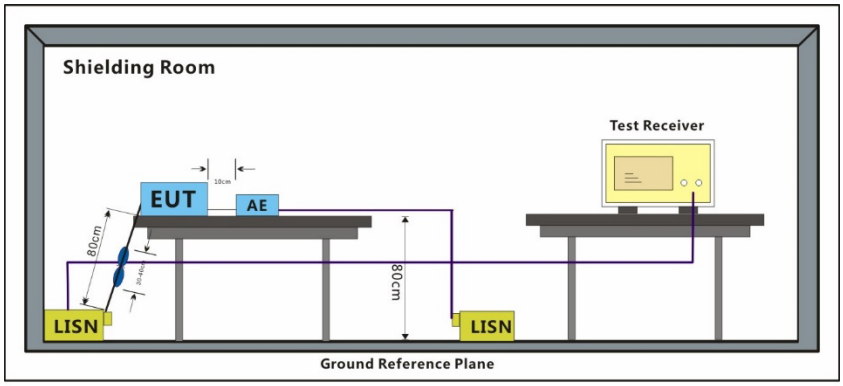
7.1.3 Test Setup Diagram



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 50ohm/50μH + 5ohm 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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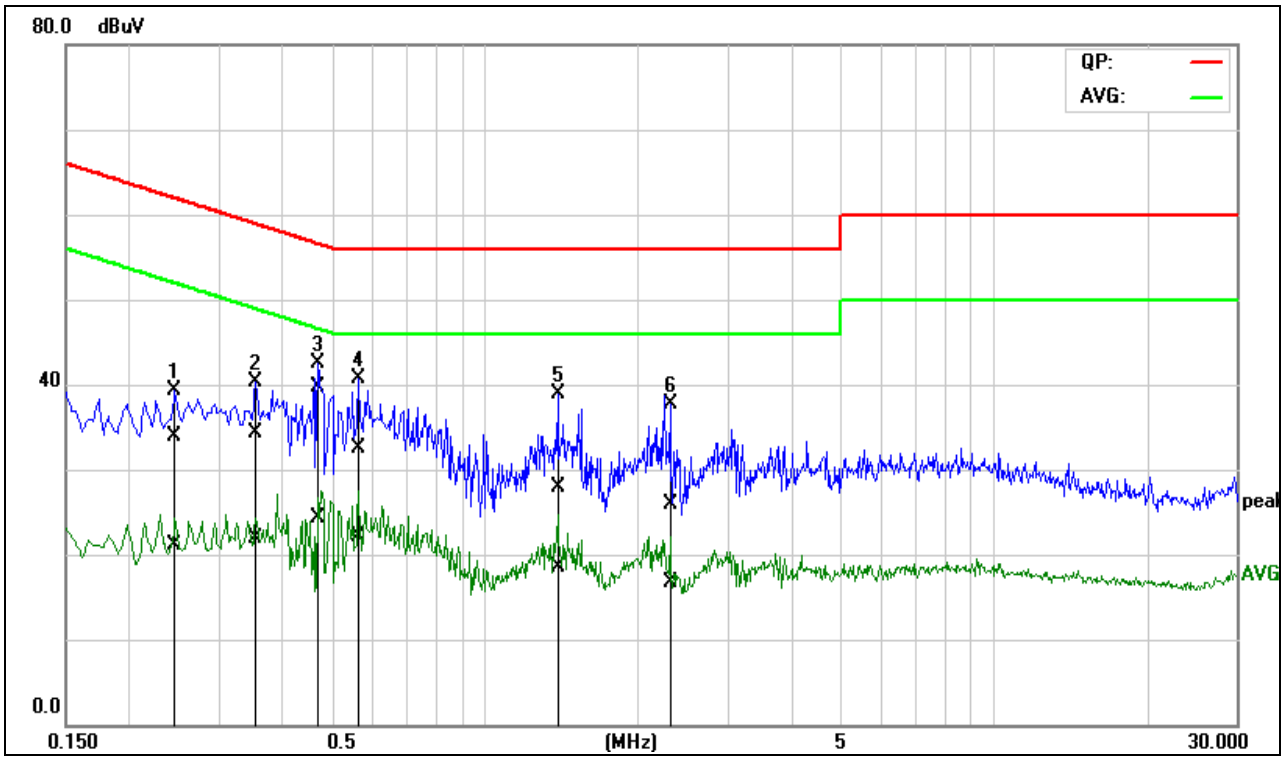
Test Mode: 00; Line: Live line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.2473	14.42	1.55	19.50	33.92	21.05	61.85	51.85	-27.93	-30.80	Pass
2	0.3547	14.85	2.32	19.52	34.37	21.84	58.85	48.85	-24.48	-27.01	Pass
3*	0.4691	20.06	4.71	19.55	39.61	24.26	56.53	46.53	-16.92	-22.27	Pass
4	0.5589	12.95	2.46	19.56	32.51	22.02	56.00	46.00	-23.49	-23.98	Pass
5	1.3757	8.35	-1.17	19.62	27.97	18.45	56.00	46.00	-28.03	-27.55	Pass
6	2.2848	6.30	-2.88	19.67	25.97	16.79	56.00	46.00	-30.03	-29.21	Pass

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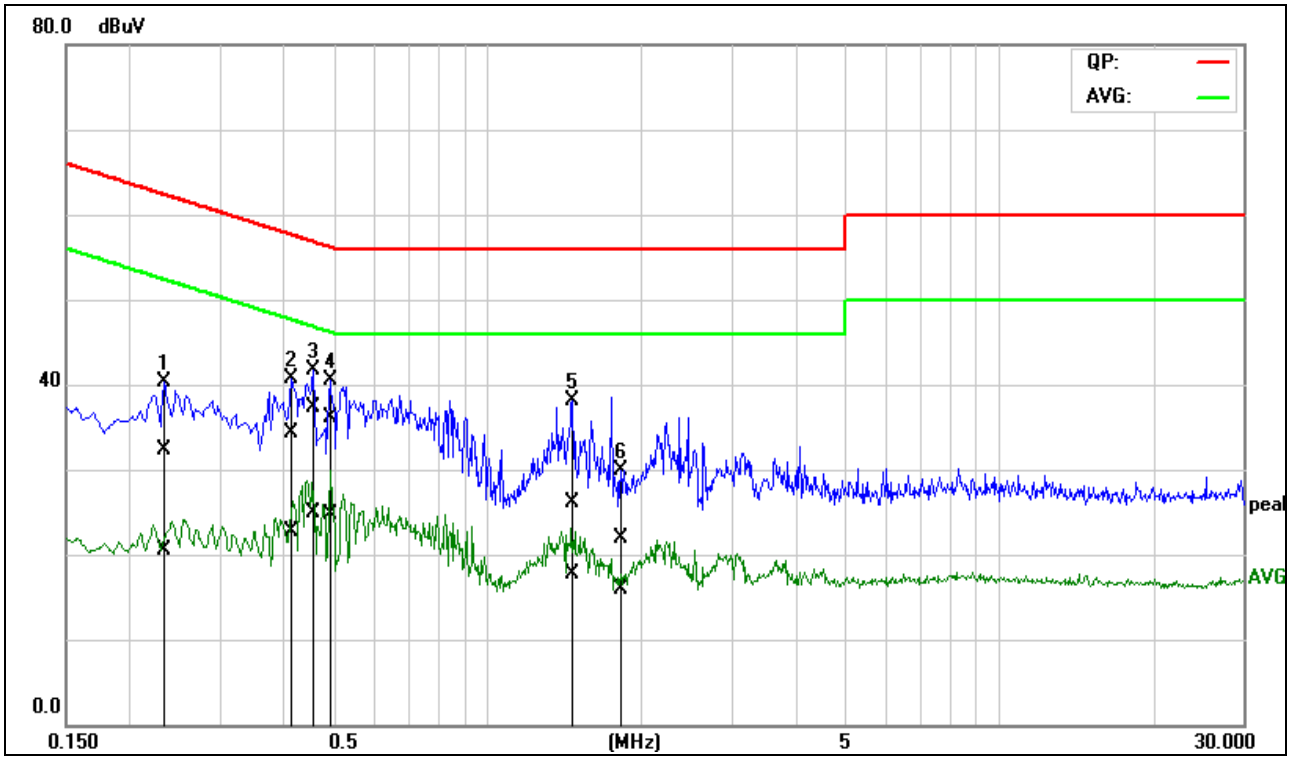

No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.2347	12.75	1.04	19.49	32.24	20.53	62.28	52.28	-30.04	-31.75	Pass
2	0.4108	14.84	3.21	19.54	34.38	22.75	57.63	47.63	-23.25	-24.88	Pass
3*	0.4576	17.75	5.34	19.55	37.30	24.89	56.74	46.74	-19.44	-21.85	Pass
4	0.4968	16.55	5.07	19.56	36.11	24.63	56.05	46.05	-19.94	-21.42	Pass
5	1.4417	6.50	-2.01	19.62	26.12	17.61	56.00	46.00	-29.88	-28.39	Pass
6	1.7952	2.27	-3.70	19.64	21.91	15.94	56.00	46.00	-34.09	-30.06	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)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 24.2 °C Humidity: 41.7 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); 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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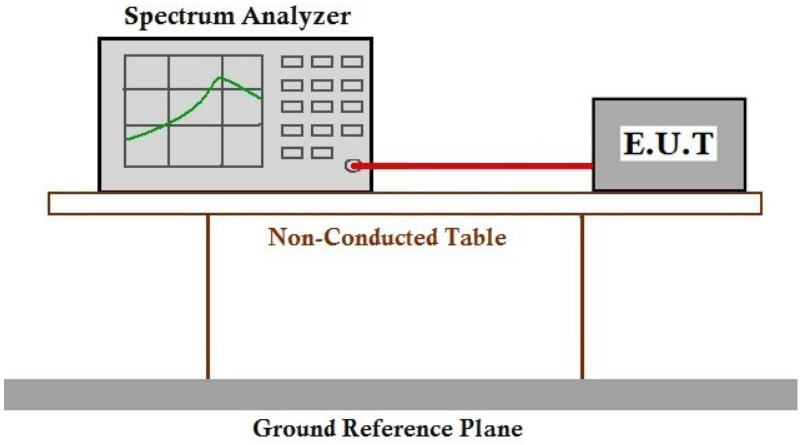
7.2.3 Test Setup Diagram



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

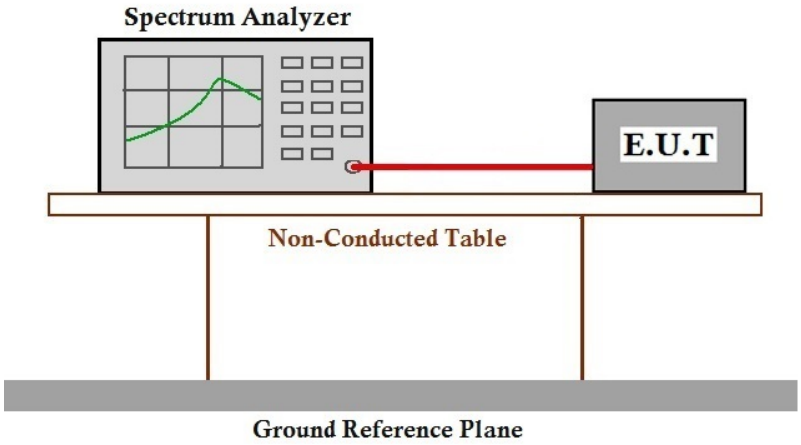
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 24.3 °C Humidity: 41.8 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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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

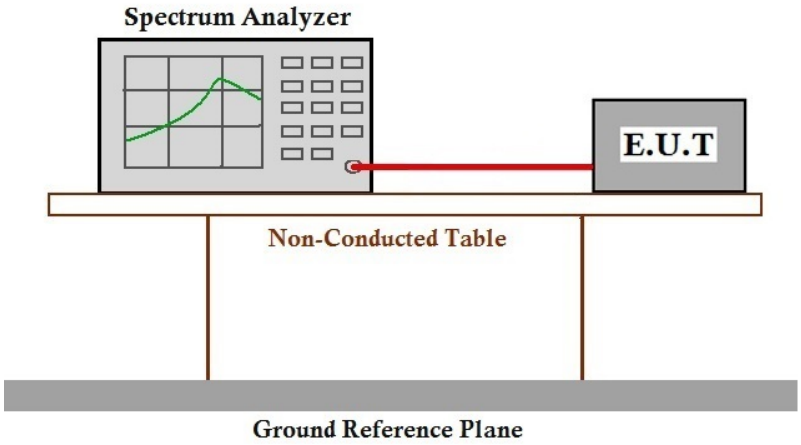
7.4.1 E.U.T. Operation

Operating Environment:
Temperature: 24.3 °C Humidity: 41.7 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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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: 24.3 °C Humidity: 41.7 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); 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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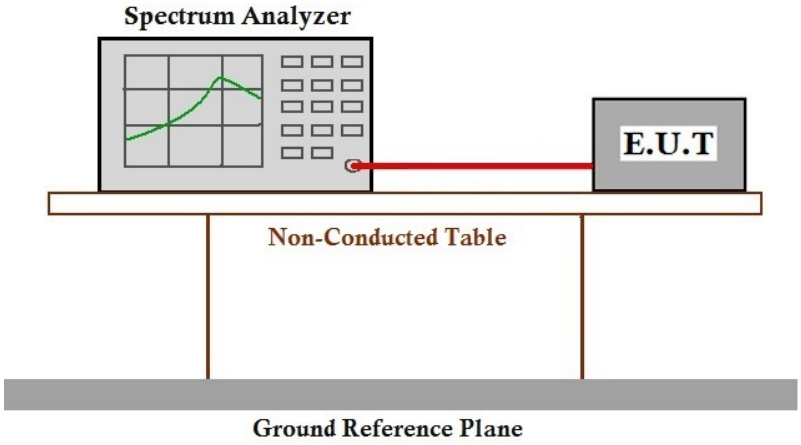
7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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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: 24.3 °C Humidity: 41.7 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); 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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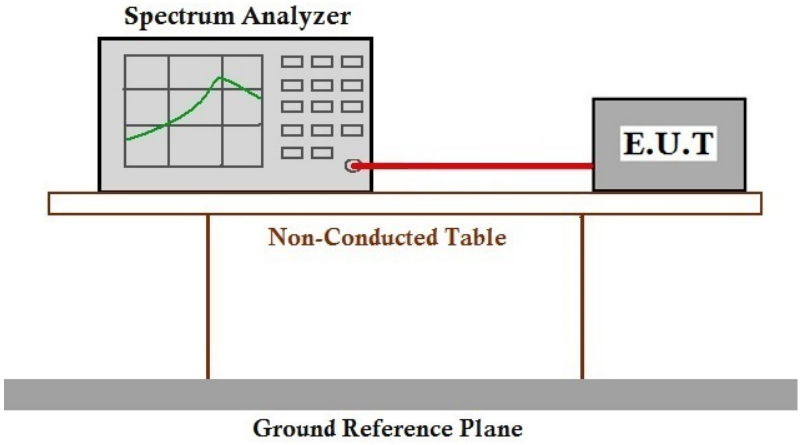
7.6.3 Test Setup Diagram



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: 25 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); 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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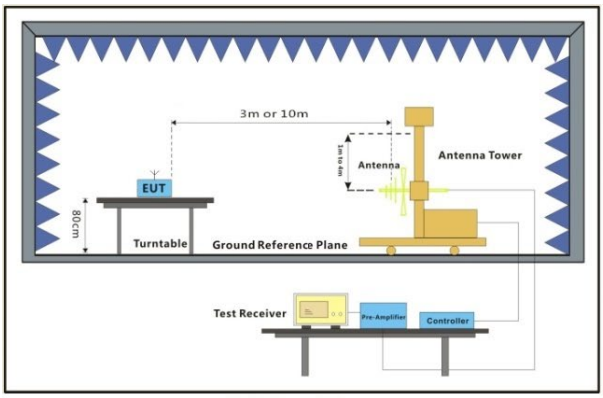
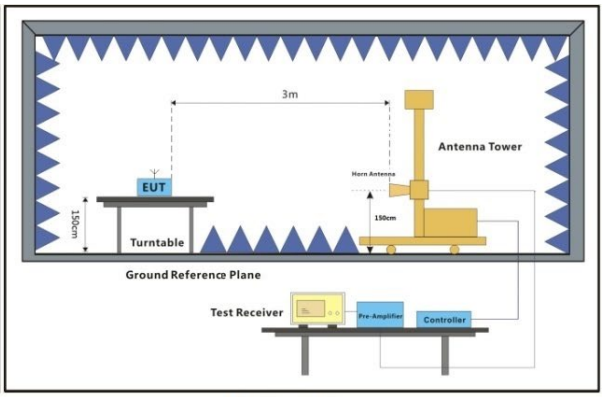
7.7.3 Test Setup Diagram



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.

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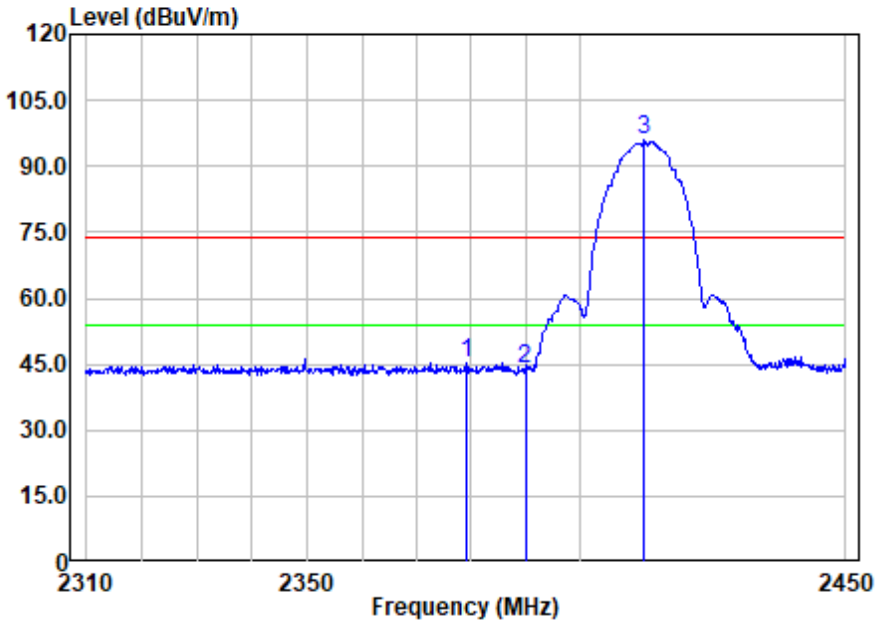
Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2379.020	5.68	26.71	55.92	45.39	74.00	-28.61	Peak
2	2390.000	5.69	26.73	54.25	43.75	74.00	-30.25	Peak
3	2412.200	5.73	26.78	106.30	95.88	74.00	21.88	Peak

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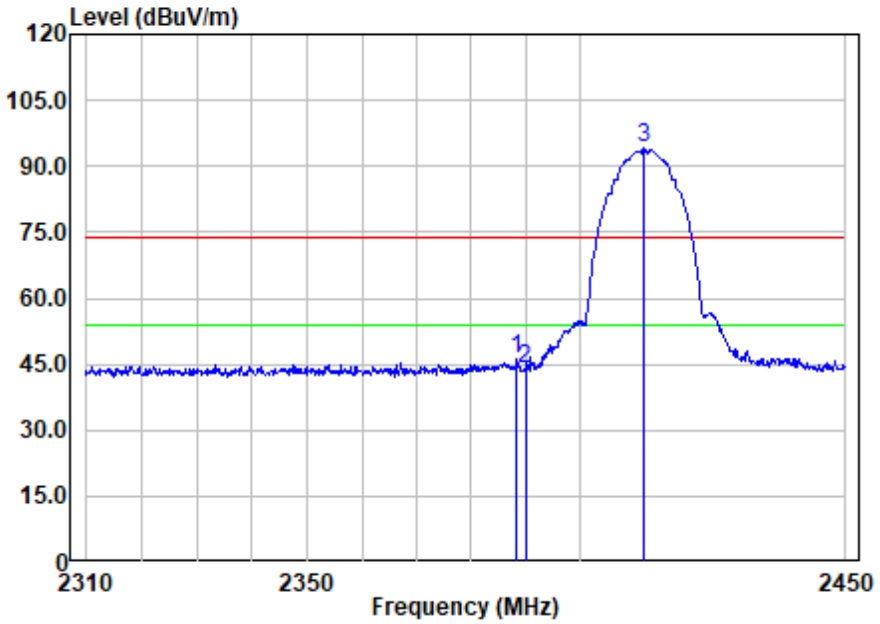
Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2388.400	5.69	26.72	56.53	46.02	74.00	-27.98	Peak
2	2390.000	5.69	26.73	54.58	44.08	74.00	-29.92	Peak
3	2412.060	5.73	26.78	104.44	94.02	74.00	20.02	Peak

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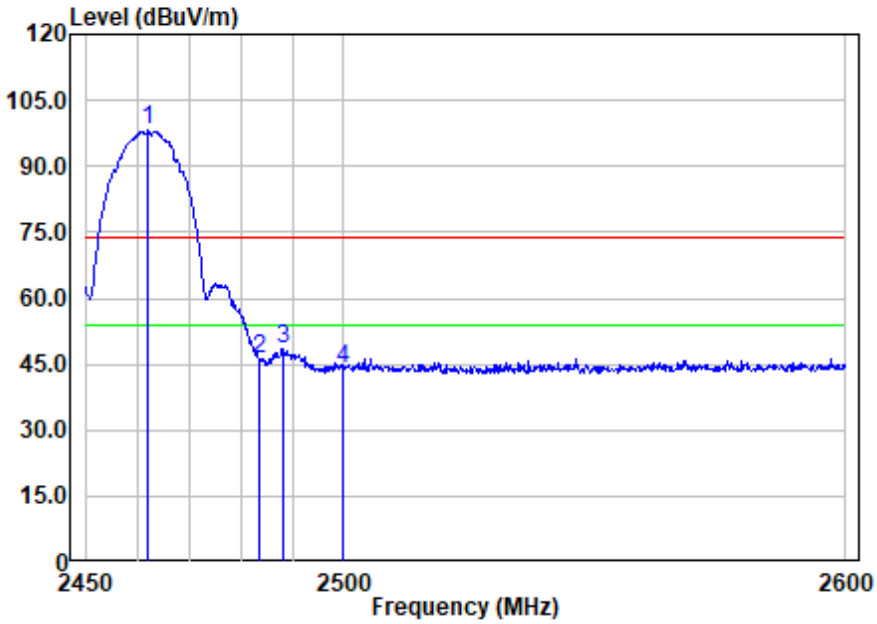
Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.80	26.96	108.30	98.12	74.00	24.12	Peak
2	2483.500	5.83	27.04	56.42	46.35	74.00	-27.65	Peak
3	2488.250	5.83	27.06	58.42	48.37	74.00	-25.63	Peak
4	2500.000	5.85	27.10	54.13	44.14	74.00	-29.86	Peak

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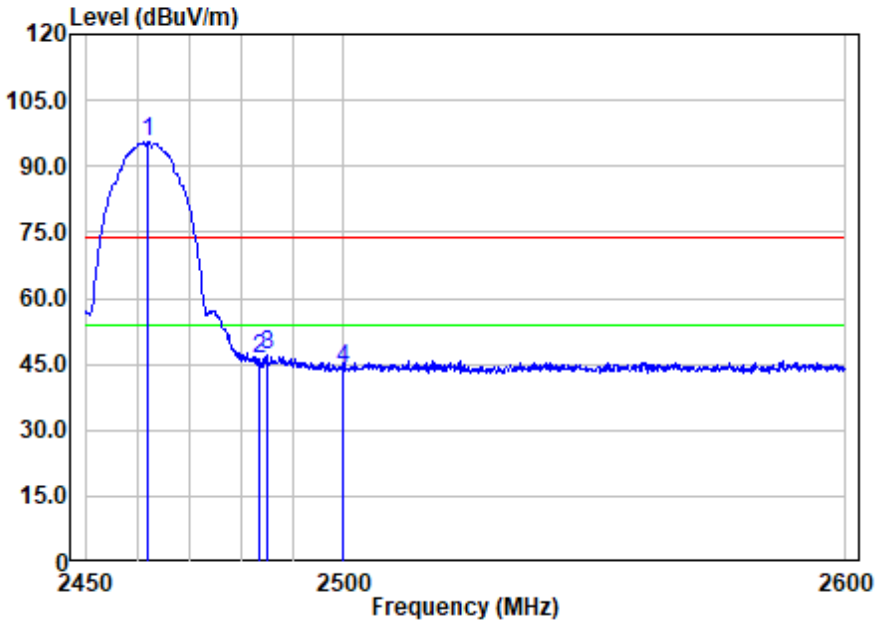
Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2462.150	5.80	26.96	105.92	95.74	74.00	21.74	Peak
2	2483.500	5.83	27.04	56.21	46.14	74.00	-27.86	Peak
3	2484.950	5.83	27.05	57.15	47.09	74.00	-26.91	Peak
4	2500.000	5.85	27.10	54.04	44.05	74.00	-29.95	Peak

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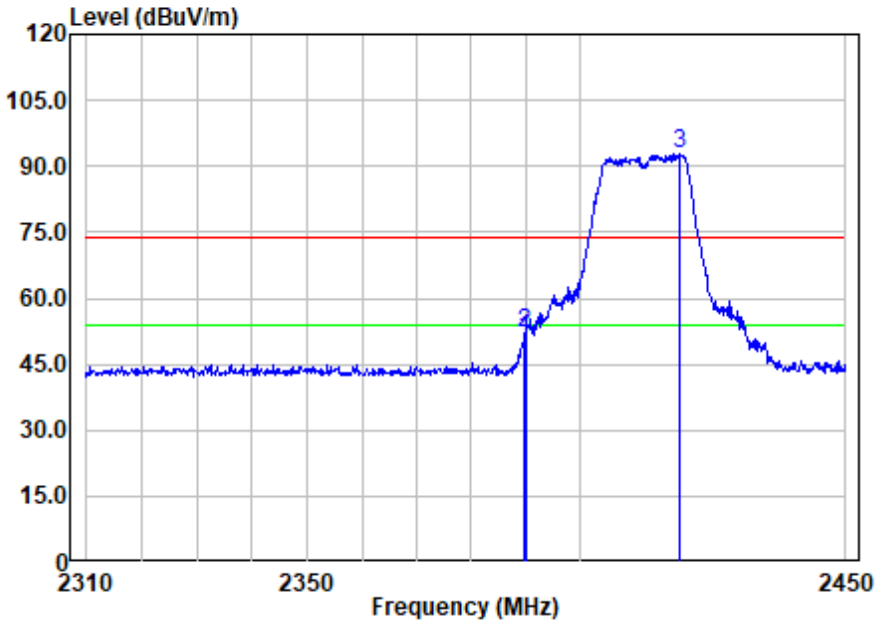
Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2389.660	5.69	26.73	61.30	50.80	74.00	-23.20	Peak
2	2390.000	5.69	26.73	62.51	52.01	74.00	-21.99	Peak
3	2418.780	5.74	26.81	103.07	92.69	74.00	18.69	Peak

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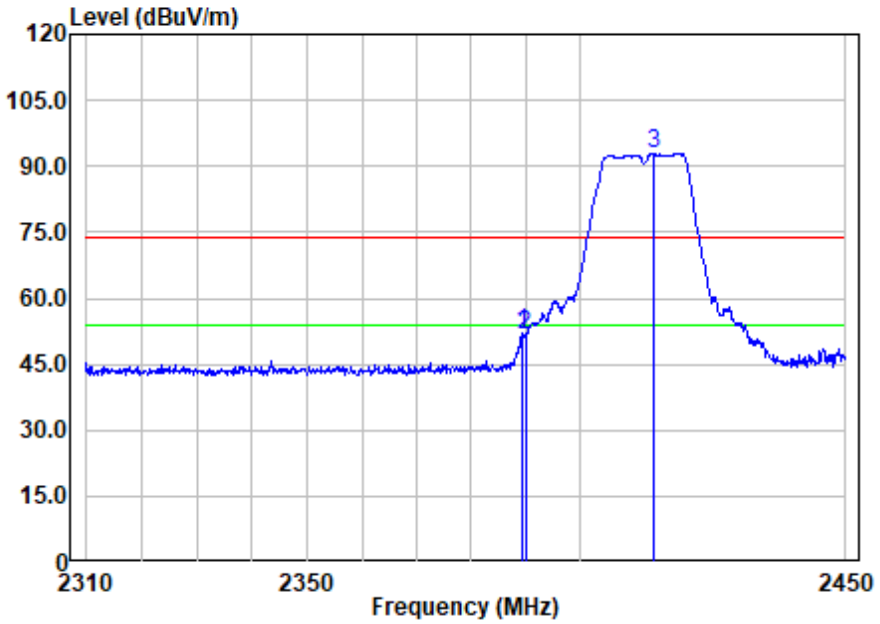
Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2389.380	5.69	26.73	62.36	51.86	74.00	-22.14	Peak
2	2390.000	5.69	26.73	62.30	51.80	74.00	-22.20	Peak
3	2413.740	5.73	26.79	103.30	92.89	74.00	18.89	Peak

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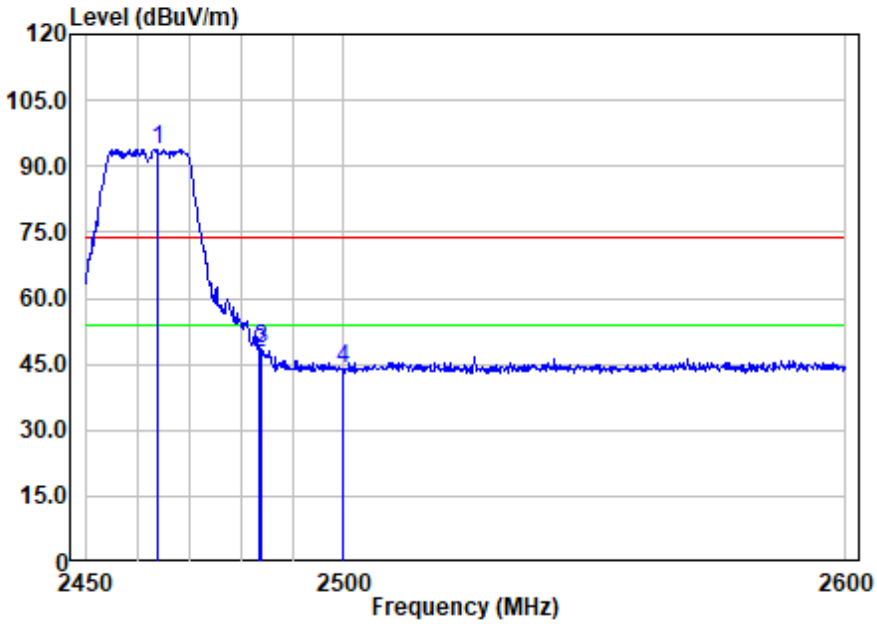
Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2463.950	5.80	26.97	104.06	93.89	74.00	19.89	Peak
2	2483.500	5.83	27.04	57.82	47.75	74.00	-26.25	Peak
3	2484.050	5.83	27.04	58.74	48.67	74.00	-25.33	Peak
4	2500.000	5.85	27.10	54.02	44.03	74.00	-29.97	Peak

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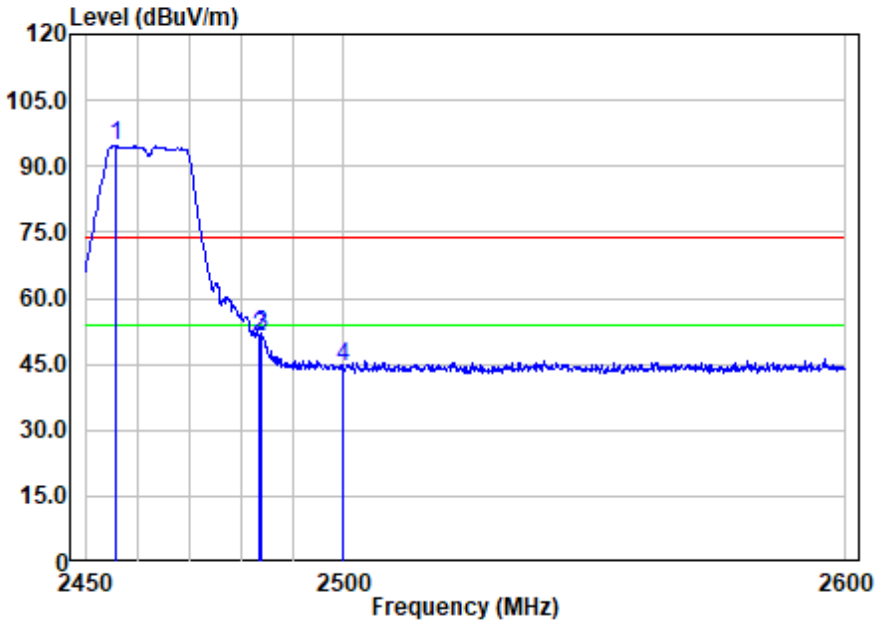
Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2455.850	5.79	26.94	104.78	94.57	74.00	20.57	Peak
2	2483.500	5.83	27.04	61.38	51.31	74.00	-22.69	Peak
3	2483.900	5.83	27.04	61.85	51.78	74.00	-22.22	Peak
4	2500.000	5.85	27.10	54.41	44.42	74.00	-29.58	Peak

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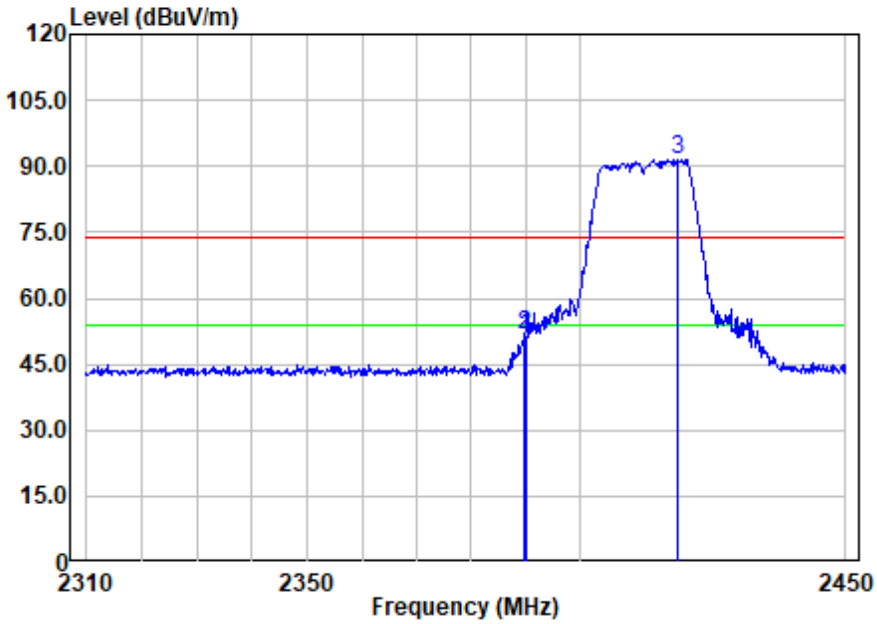
Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2389.660	5.69	26.73	61.77	51.27	74.00	-22.73	Peak
2	2390.000	5.69	26.73	62.00	51.50	74.00	-22.50	Peak
3	2418.500	5.73	26.81	101.96	91.57	74.00	17.57	Peak

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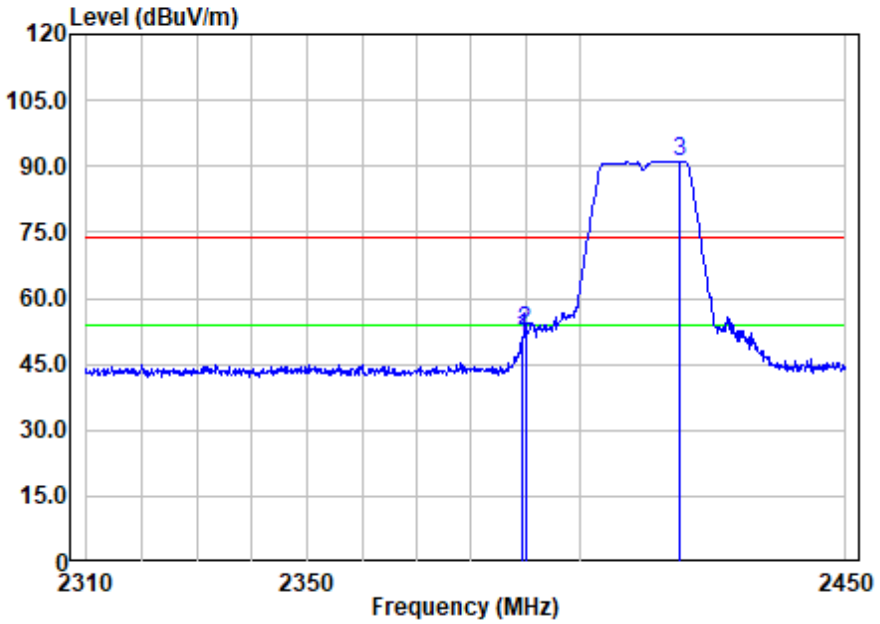
Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2389.380	5.69	26.73	61.89	51.39	74.00	-22.61	Peak
2	2390.000	5.69	26.73	63.21	52.71	74.00	-21.29	Peak
3	2418.640	5.73	26.81	101.56	91.17	74.00	17.17	Peak

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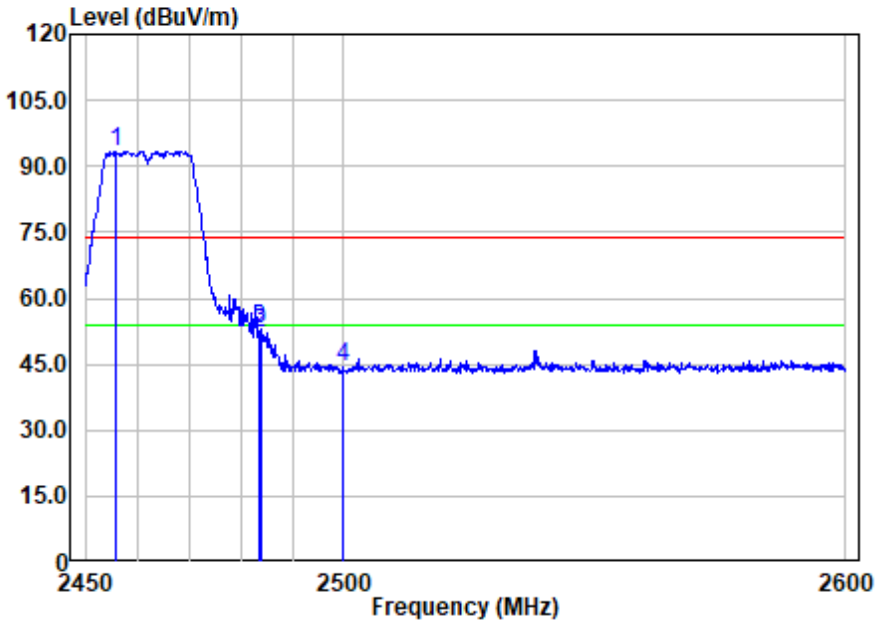
Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2456.000	5.79	26.94	103.65	93.44	74.00	19.44	Peak
2	2483.450	5.83	27.04	62.20	52.13	74.00	-21.87	Peak
3	2483.750	5.83	27.04	62.89	52.82	74.00	-21.18	Peak
4	2500.000	5.85	27.10	54.19	44.20	74.00	-29.80	Peak

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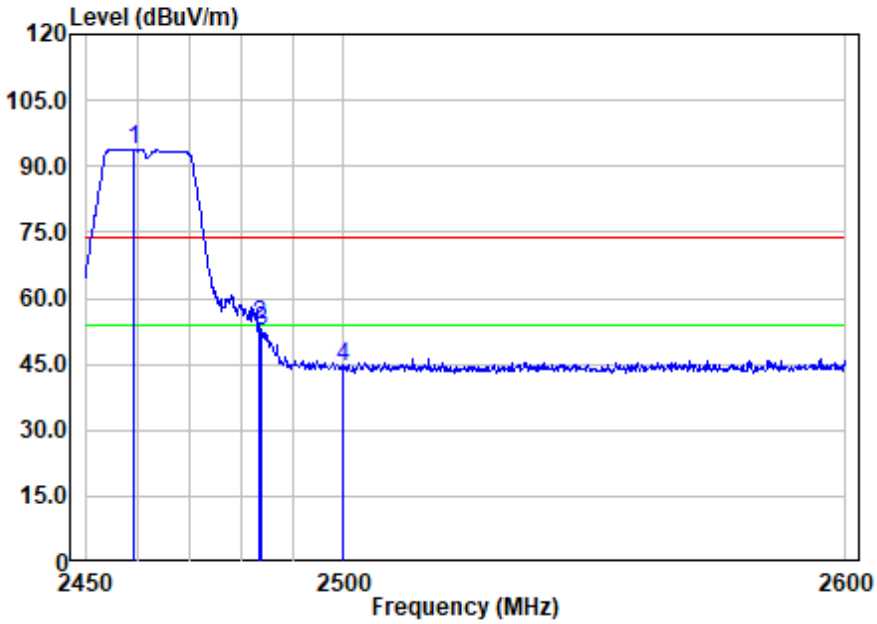
Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2459.150	5.79	26.95	104.15	93.95	74.00	19.95	Peak
2	2483.500	5.83	27.04	63.97	53.90	74.00	-20.10	Peak
3	2484.050	5.83	27.04	62.78	52.71	74.00	-21.29	Peak
4	2500.000	5.85	27.10	54.32	44.33	74.00	-29.67	Peak

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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: 25 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); 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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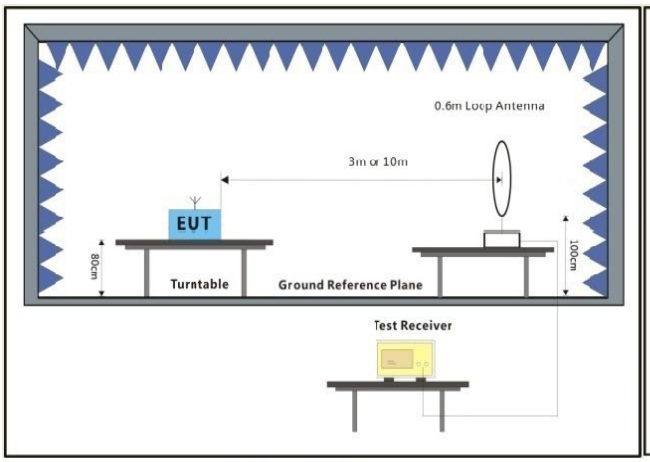
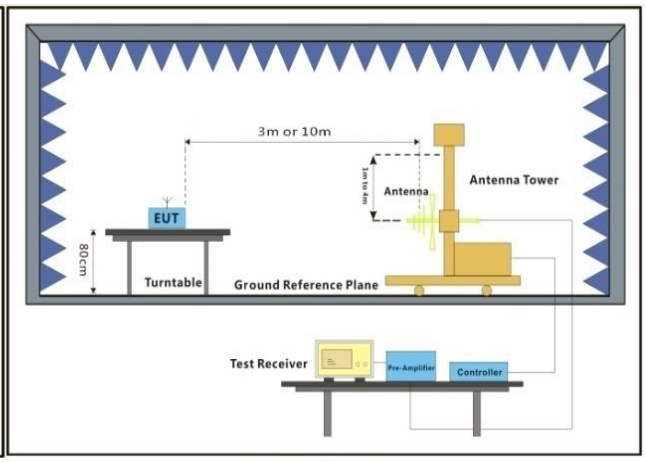
7.8.3 Test Setup Diagram



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.

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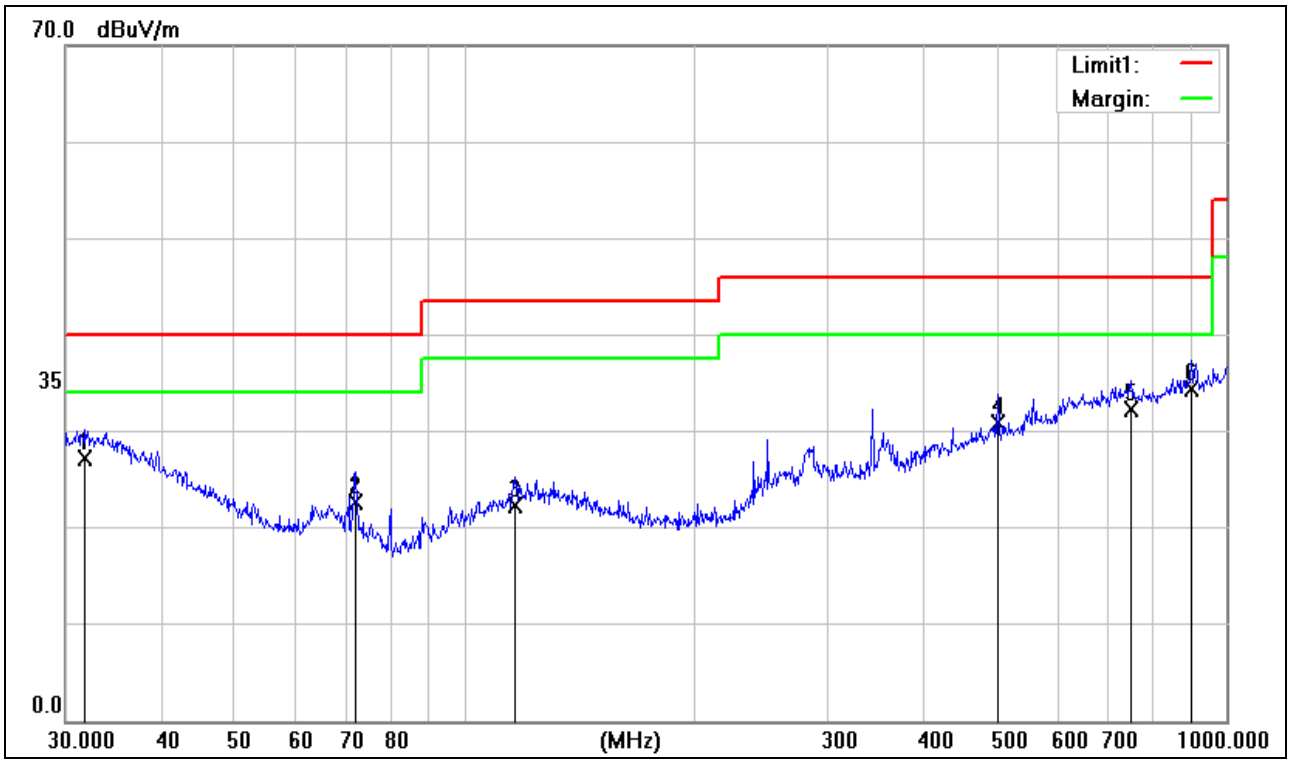
Test Mode: 00; Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	31.8427	2.02	25.16	27.18	40.00	-12.82	200	329	QP
2	72.0843	7.13	15.62	22.75	40.00	-17.25	200	0	QP
3	116.5401	3.20	19.16	22.36	43.50	-21.14	200	259	QP
4	501.1790	5.12	25.75	30.87	46.00	-15.13	100	264	QP
5	750.1083	29.93	2.36	32.29	46.00	-13.71	200	2	QP
6	900.1474	31.89	2.45	34.34	46.00	-11.66	200	191	QP

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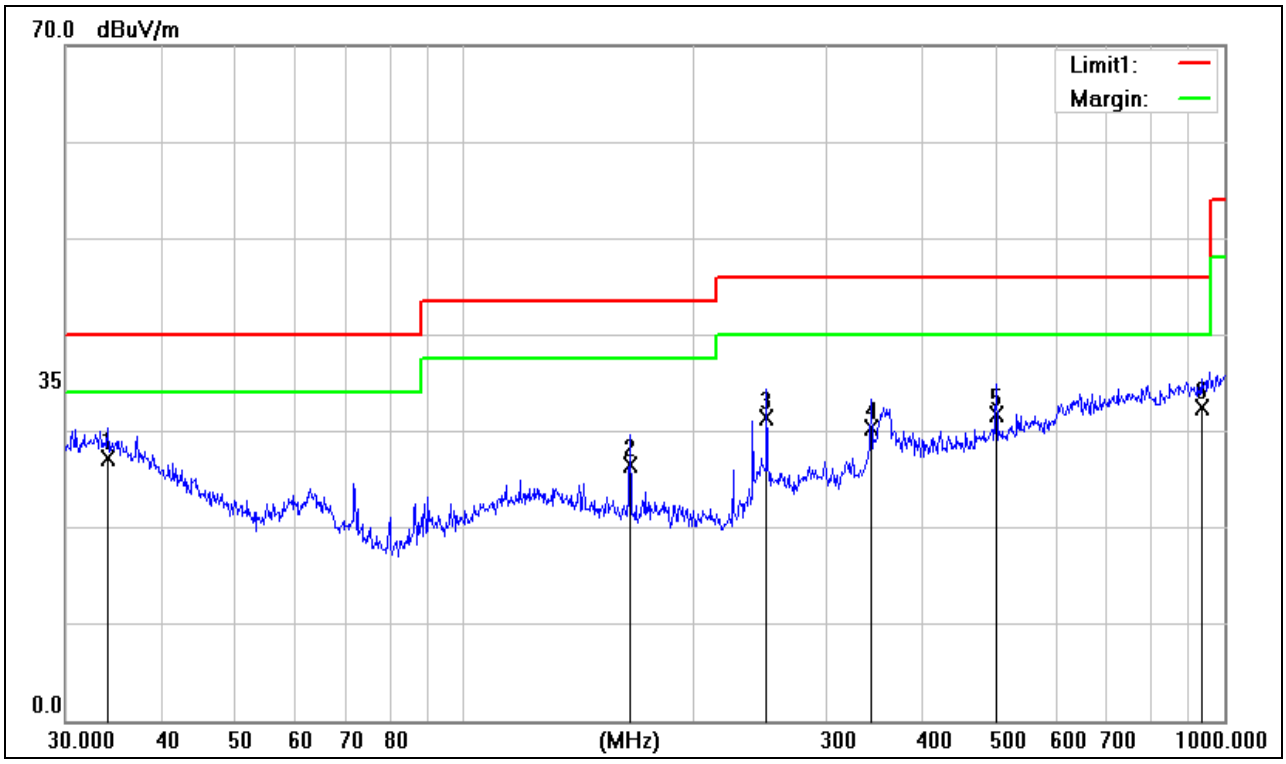
Test Mode: 00; Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	34.0365	2.38	24.90	27.28	40.00	-12.72	100	155	QP
2	165.4867	9.38	17.21	26.59	43.50	-16.91	200	0	QP
3	250.3012	11.60	19.79	31.39	46.00	-14.61	200	68	QP
4	343.1800	8.75	21.61	30.36	46.00	-15.64	100	360	QP
5	501.1790	6.09	25.75	31.84	46.00	-14.16	200	8	QP
6	932.2715	3.32	29.06	32.38	46.00	-13.62	200	332	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

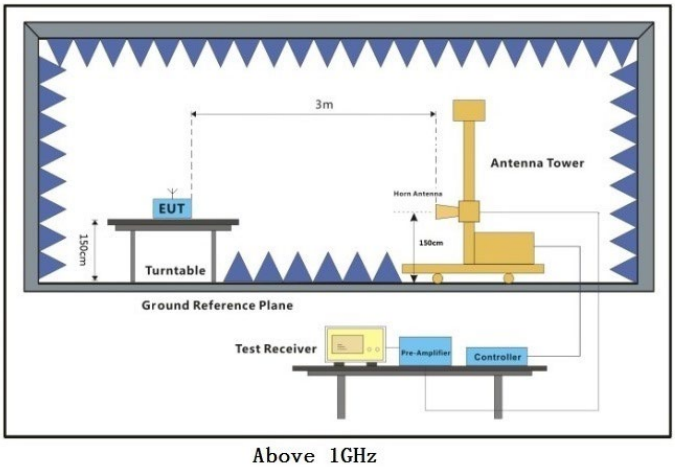
7.9.1 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_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); final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

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.

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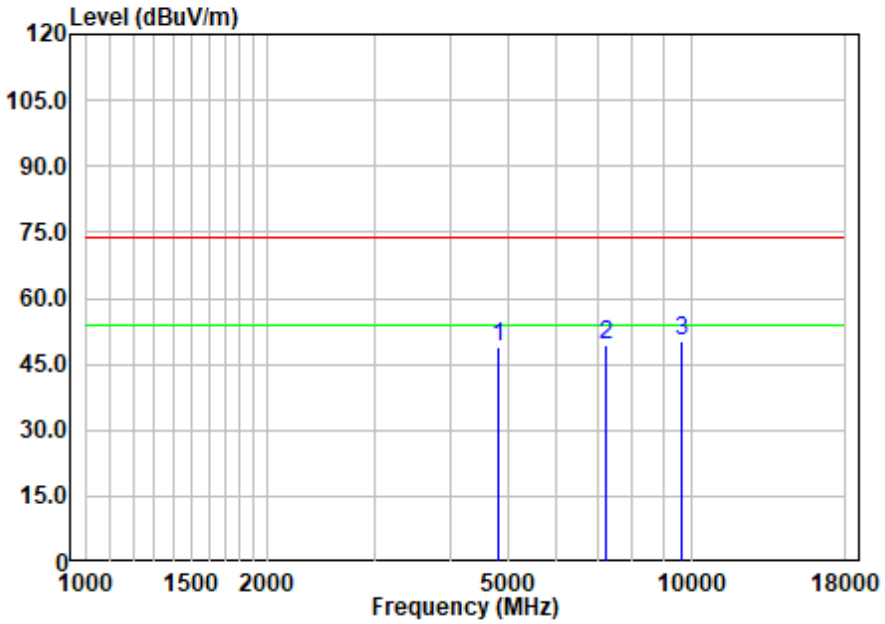
Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	8.13	34.18	48.72	48.79	74.00	-25.21	Peak
2	7236.000	10.37	35.44	46.36	49.56	74.00	-24.44	Peak
3	9648.000	12.32	36.96	43.18	50.14	74.00	-23.86	Peak

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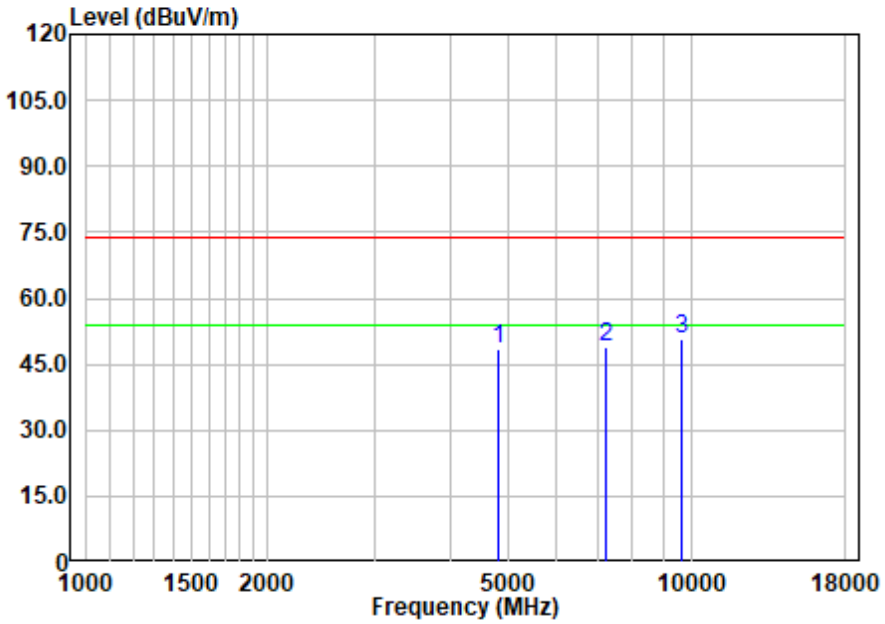
Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	8.13	34.18	48.35	48.42	74.00	-25.58	Peak
2	7236.000	10.37	35.44	45.83	49.03	74.00	-24.97	Peak
3	9648.000	12.32	36.96	43.96	50.92	74.00	-23.08	Peak

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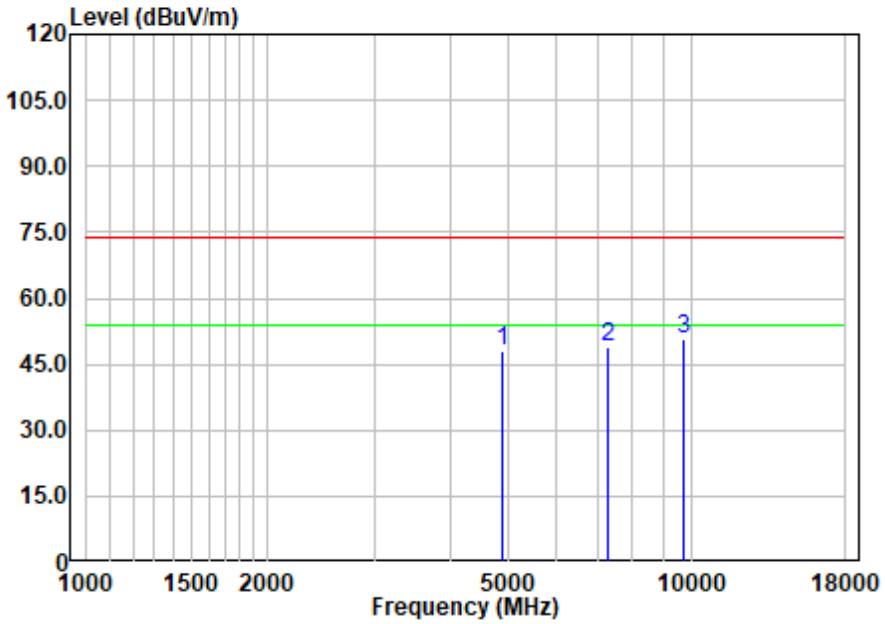
Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	8.16	34.18	47.78	48.20	74.00	-25.80	Peak
2	7311.000	10.44	35.46	45.68	49.08	74.00	-24.92	Peak
3	9748.000	12.40	37.04	43.75	50.58	74.00	-23.42	Peak

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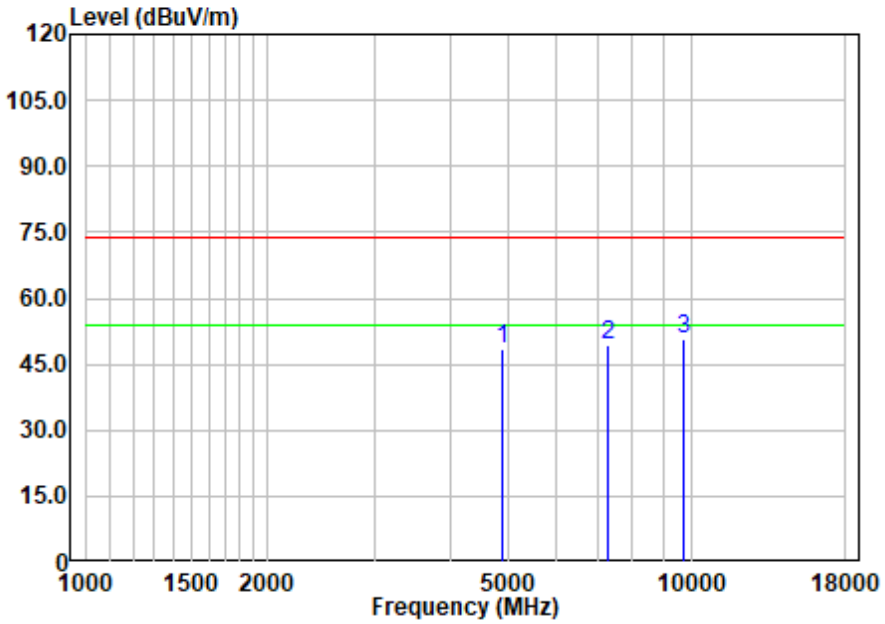
Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	8.16	34.18	48.10	48.52	74.00	-25.48	Peak
2	7311.000	10.44	35.46	46.14	49.54	74.00	-24.46	Peak
3	9748.000	12.40	37.04	43.70	50.53	74.00	-23.47	Peak

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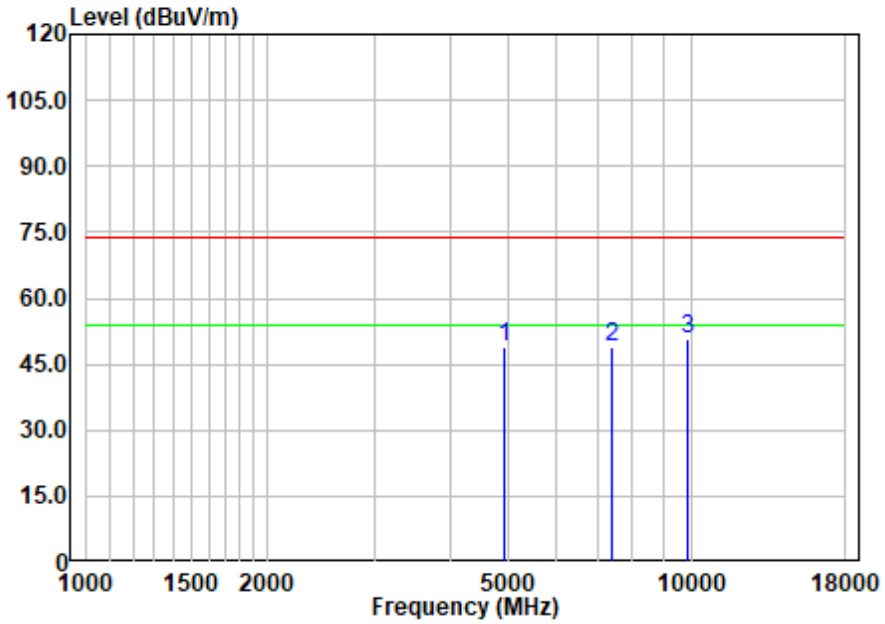
Test Mode: 00; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	8.19	34.17	48.32	48.99	74.00	-25.01	Peak
2	7386.000	10.52	35.49	45.52	49.09	74.00	-24.91	Peak
3	9848.000	12.49	37.12	43.69	50.87	74.00	-23.13	Peak

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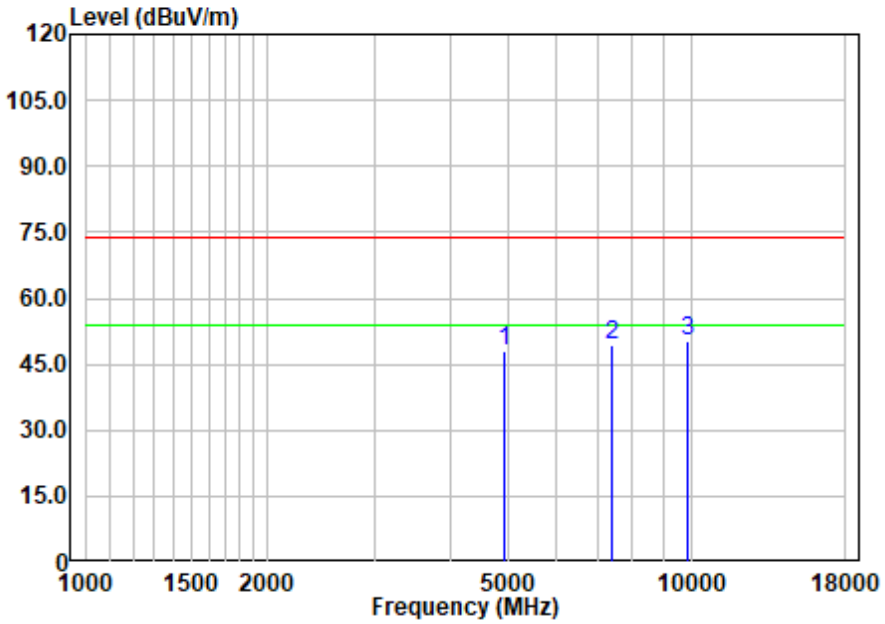
Test Mode: 00; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	8.19	34.17	47.38	48.05	74.00	-25.95	Peak
2	7386.000	10.52	35.49	45.68	49.25	74.00	-24.75	Peak
3	9848.000	12.49	37.12	42.93	50.11	74.00	-23.89	Peak

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300 t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
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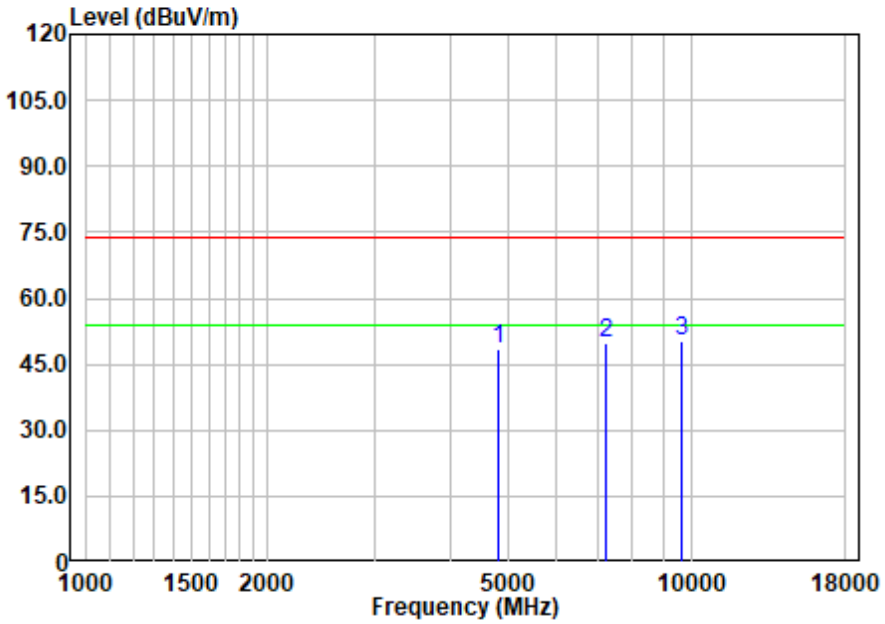
Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	8.13	34.18	48.31	48.38	74.00	-25.62	Peak
2	7236.000	10.37	35.44	46.51	49.71	74.00	-24.29	Peak
3	9648.000	12.32	36.96	43.33	50.29	74.00	-23.71	Peak

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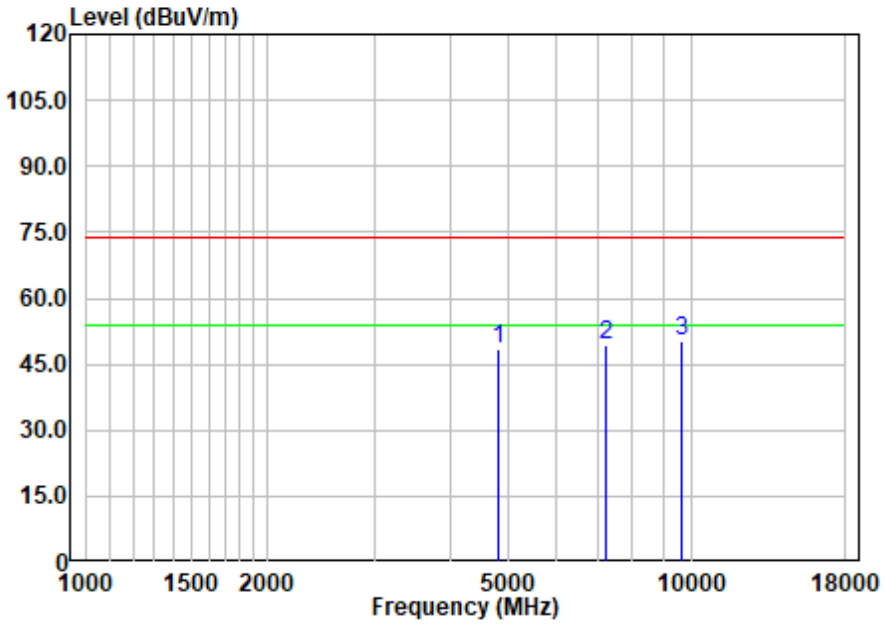
Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	8.13	34.18	48.24	48.31	74.00	-25.69	Peak
2	7236.000	10.37	35.44	46.12	49.32	74.00	-24.68	Peak
3	9648.000	12.32	36.96	43.32	50.28	74.00	-23.72	Peak

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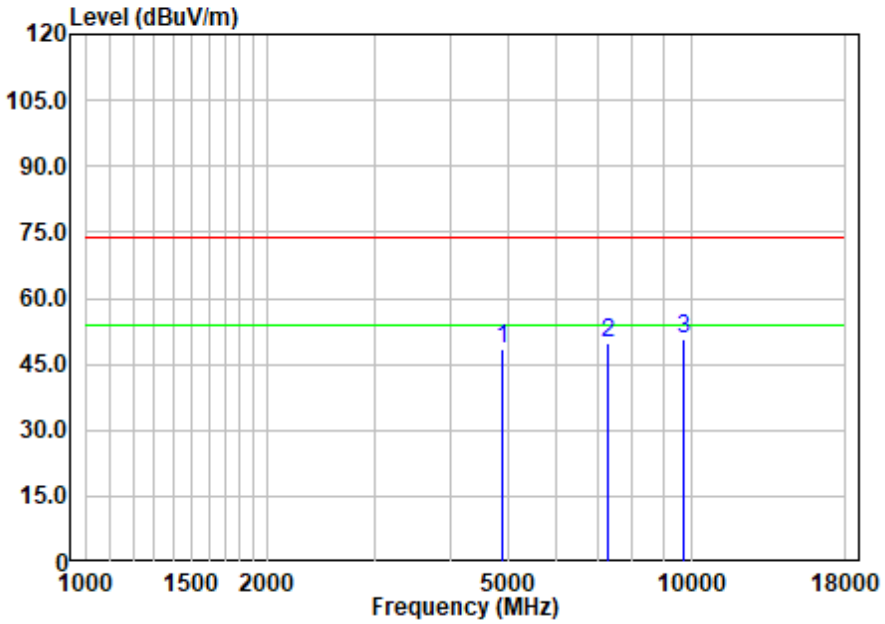
Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	8.16	34.18	48.08	48.50	74.00	-25.50	Peak
2	7311.000	10.44	35.46	46.19	49.59	74.00	-24.41	Peak
3	9748.000	12.40	37.04	44.10	50.93	74.00	-23.07	Peak

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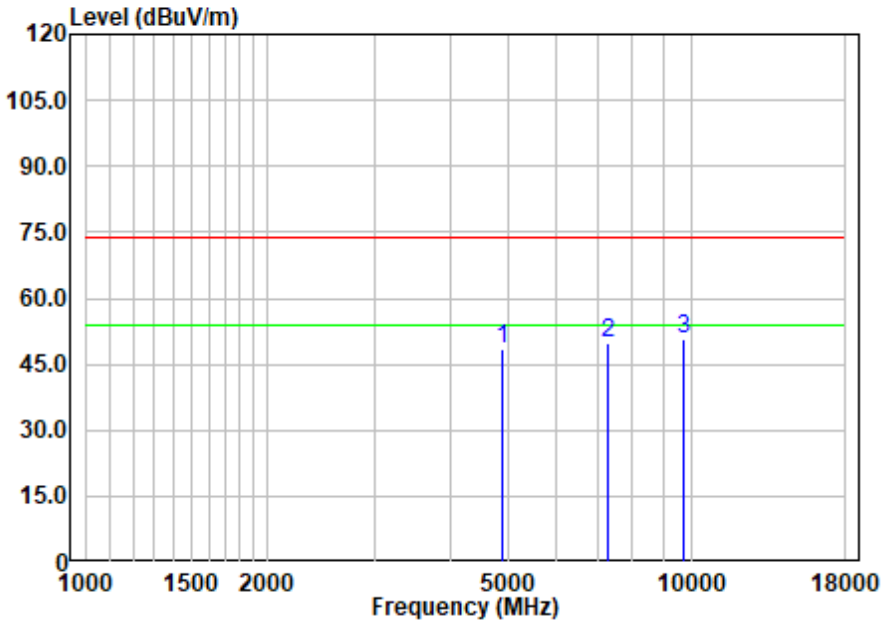
Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	8.16	34.18	48.16	48.58	74.00	-25.42	Peak
2	7311.000	10.44	35.46	46.39	49.79	74.00	-24.21	Peak
3	9748.000	12.40	37.04	43.80	50.63	74.00	-23.37	Peak

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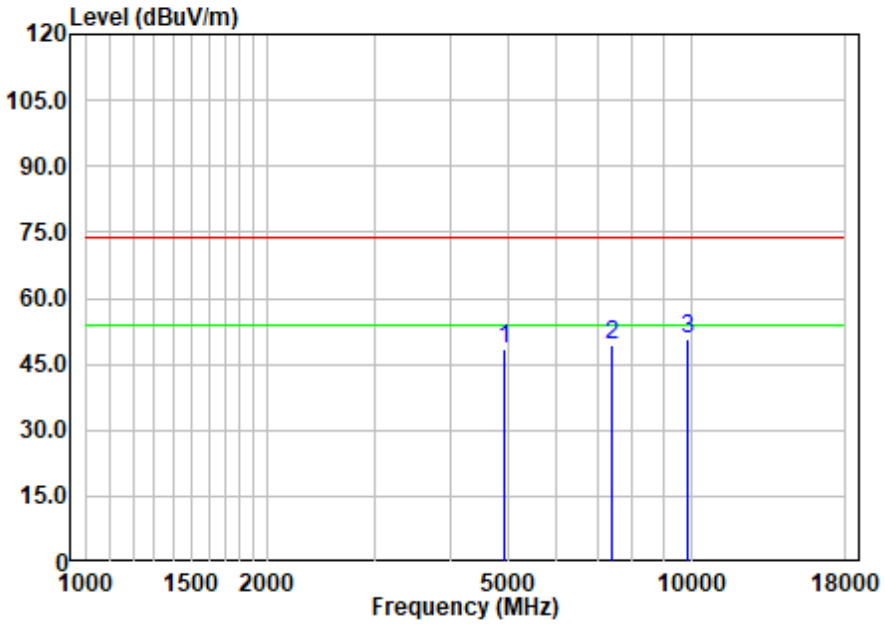
Test Mode: 00; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	8.19	34.17	47.95	48.62	74.00	-25.38	Peak
2	7386.000	10.52	35.49	45.90	49.47	74.00	-24.53	Peak
3	9848.000	12.49	37.12	43.59	50.77	74.00	-23.23	Peak

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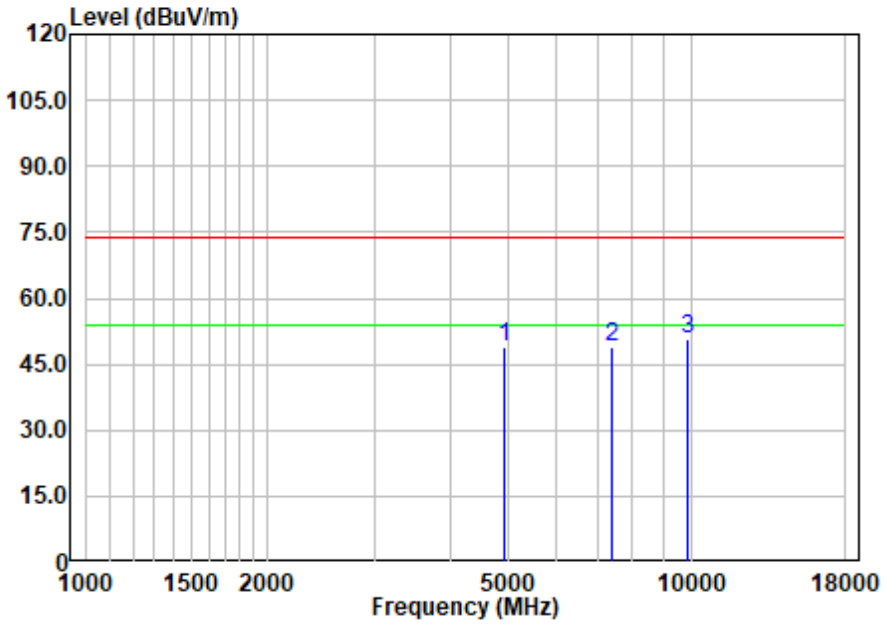
Test Mode: 00; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	8.19	34.17	48.22	48.89	74.00	-25.11	Peak
2	7386.000	10.52	35.49	45.50	49.07	74.00	-24.93	Peak
3	9848.000	12.49	37.12	43.37	50.55	74.00	-23.45	Peak

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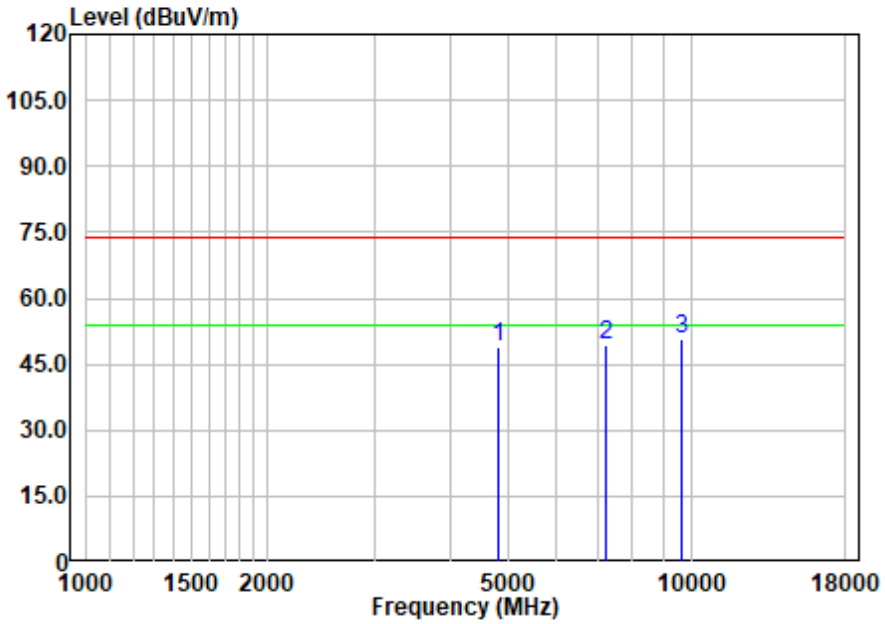
Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	8.13	34.18	48.61	48.68	74.00	-25.32	Peak
2	7236.000	10.37	35.44	46.29	49.49	74.00	-24.51	Peak
3	9648.000	12.32	36.96	43.64	50.60	74.00	-23.40	Peak

No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300 t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
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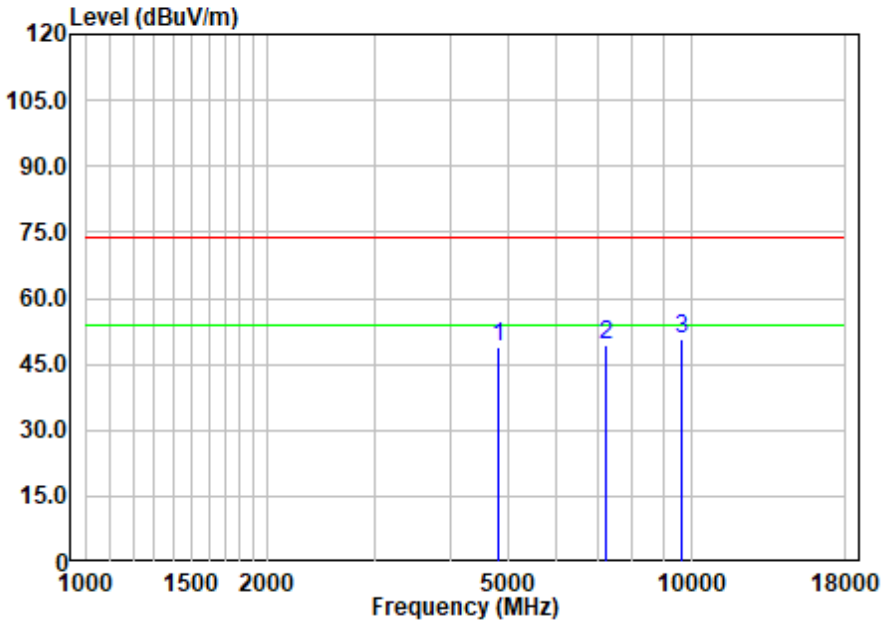
Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4824.000	8.13	34.18	48.64	48.71	74.00	-25.29	Peak
2	7236.000	10.37	35.44	46.15	49.35	74.00	-24.65	Peak
3	9648.000	12.32	36.96	43.56	50.52	74.00	-23.48	Peak

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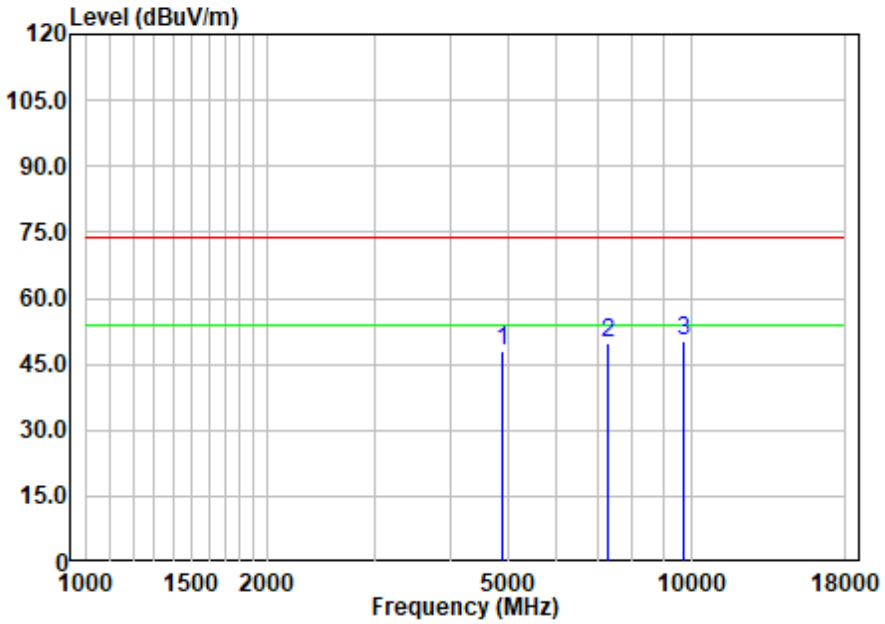
Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	8.16	34.18	47.77	48.19	74.00	-25.81	Peak
2	7311.000	10.44	35.46	46.40	49.80	74.00	-24.20	Peak
3	9748.000	12.40	37.04	43.28	50.11	74.00	-23.89	Peak

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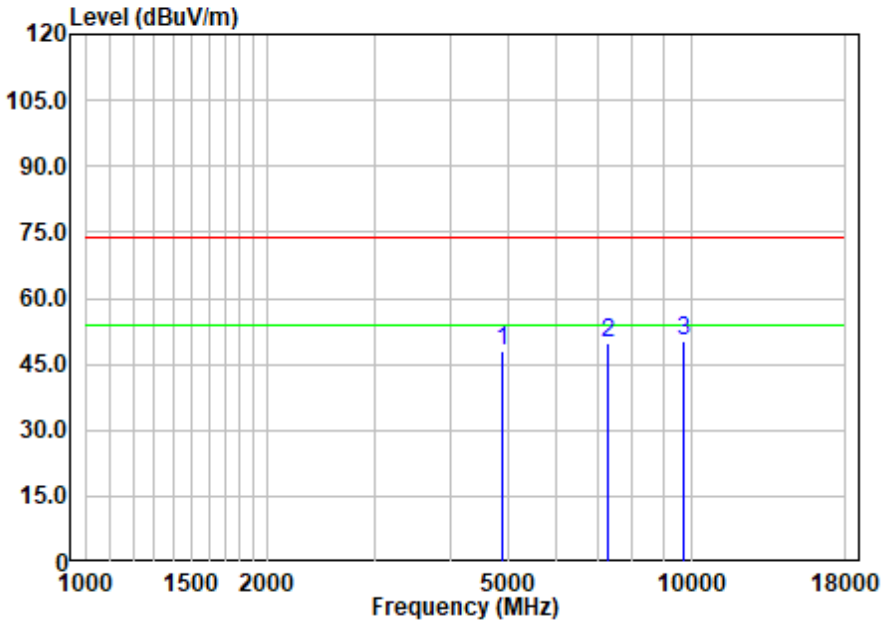
Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4874.000	8.16	34.18	47.67	48.09	74.00	-25.91	Peak
2	7311.000	10.44	35.46	46.19	49.59	74.00	-24.41	Peak
3	9748.000	12.40	37.04	43.49	50.32	74.00	-23.68	Peak

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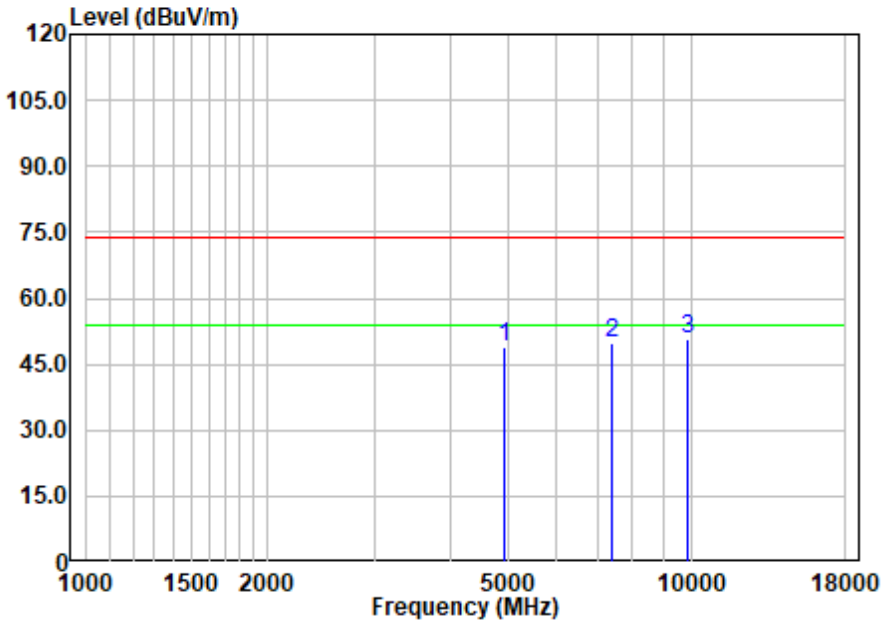
Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	8.19	34.17	48.24	48.91	74.00	-25.09	Peak
2	7386.000	10.52	35.49	46.15	49.72	74.00	-24.28	Peak
3	9848.000	12.49	37.12	43.59	50.77	74.00	-23.23	Peak

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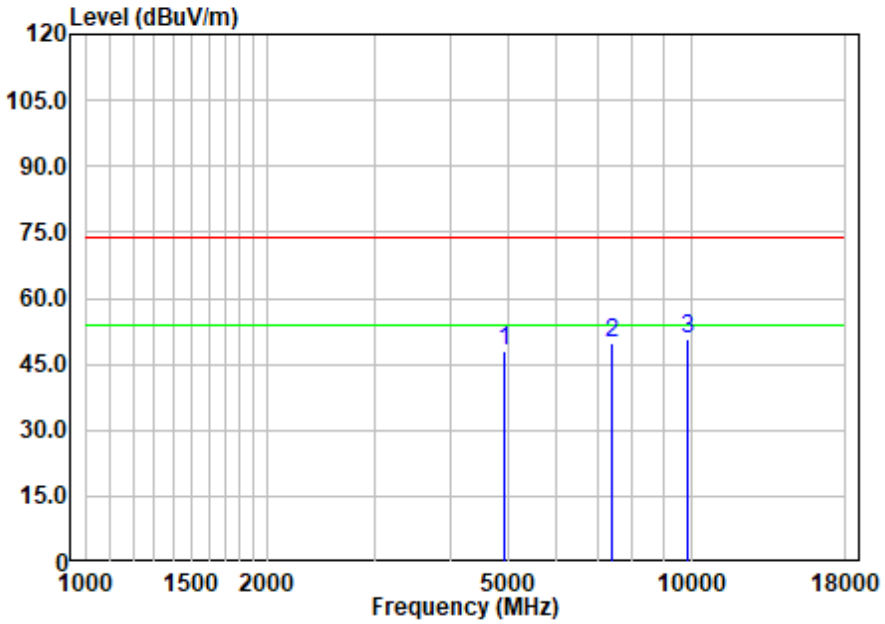
Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



	Freq	Cable Loss	Ant Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	4924.000	8.19	34.17	47.51	48.18	74.00	-25.82	Peak
2	7386.000	10.52	35.49	46.39	49.96	74.00	-24.04	Peak
3	9848.000	12.49	37.12	43.36	50.54	74.00	-23.46	Peak

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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2208001587AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2208001587AT

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10 Appendix

Appendix for KSCR2208001587AT-FCC-2.4G

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 (%)
802.11b	SISO	2412	8.383	8.430	99.44	0.02	0.00
		2437	8.384	8.430	99.45	0.02	0.04
		2462	8.383	8.430	99.44	0.02	0.04
802.11g	SISO	2412	1.395	1.446	96.47	0.16	0.03
		2437	1.395	1.447	96.41	0.16	0.03
		2462	1.394	1.446	96.40	0.16	0.03
802.11n (HT20)	SISO	2412	1.302	1.354	96.16	0.17	0.03
		2437	1.302	1.353	96.23	0.17	0.03
		2462	1.303	1.354	96.23	0.17	0.03

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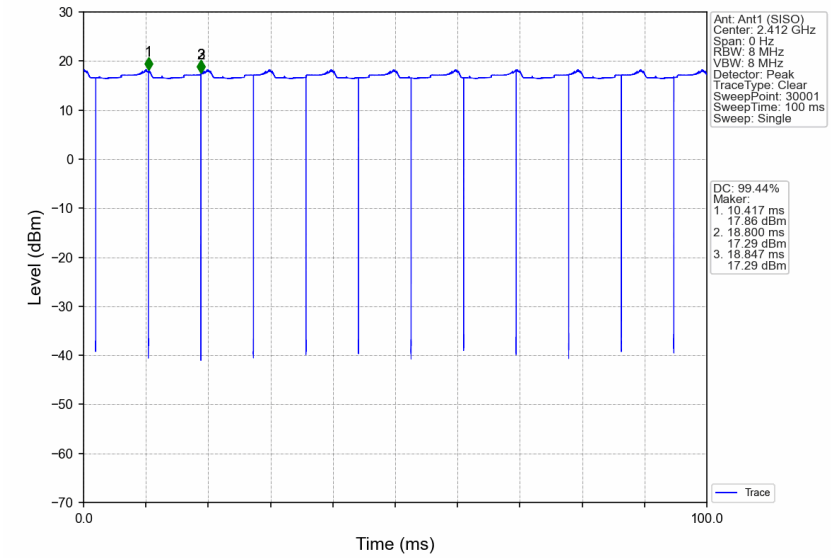
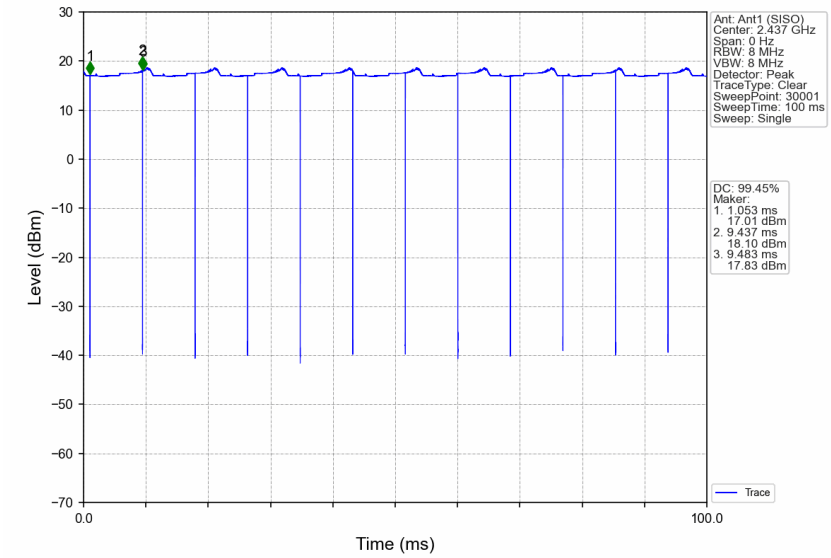
1.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV

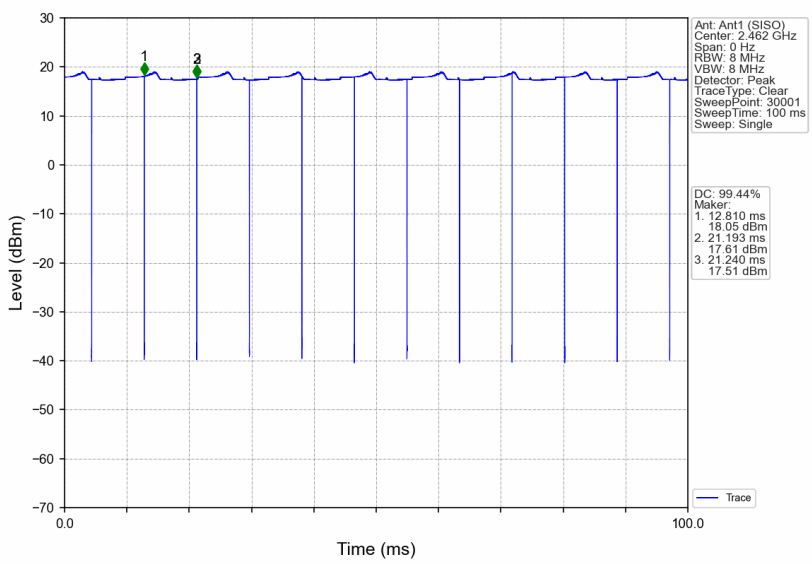


802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV

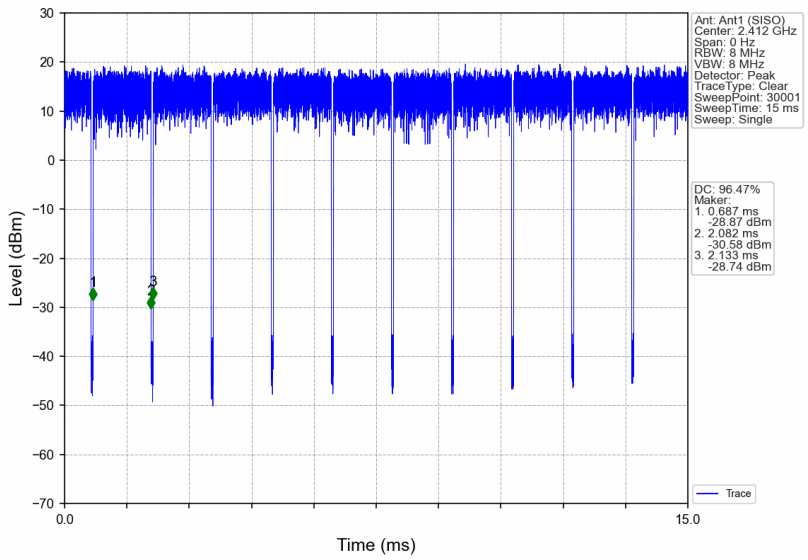


No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300 t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
中国・江苏・昆山市留学生创业园伟业路10号 邮编 215300 t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV

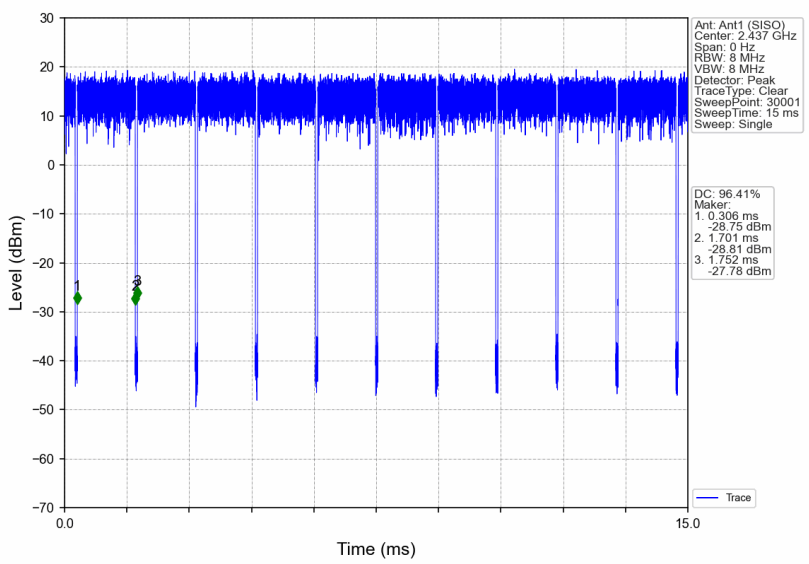


802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV

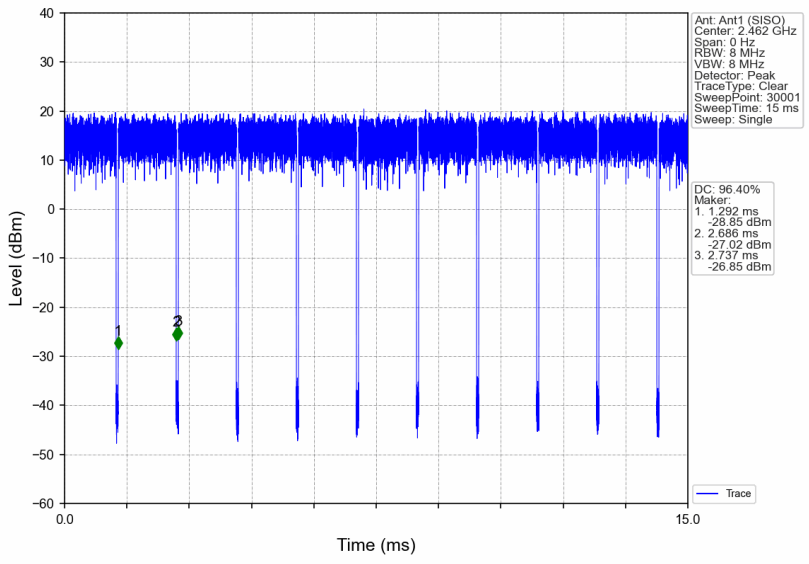


No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300 t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
中国・江苏・昆山市留学生创业园伟业路10号 邮编 215300 t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV

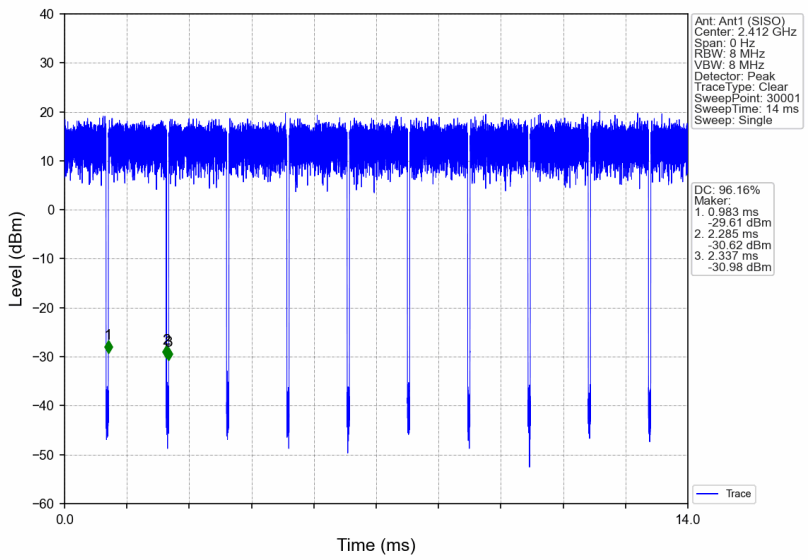


802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV

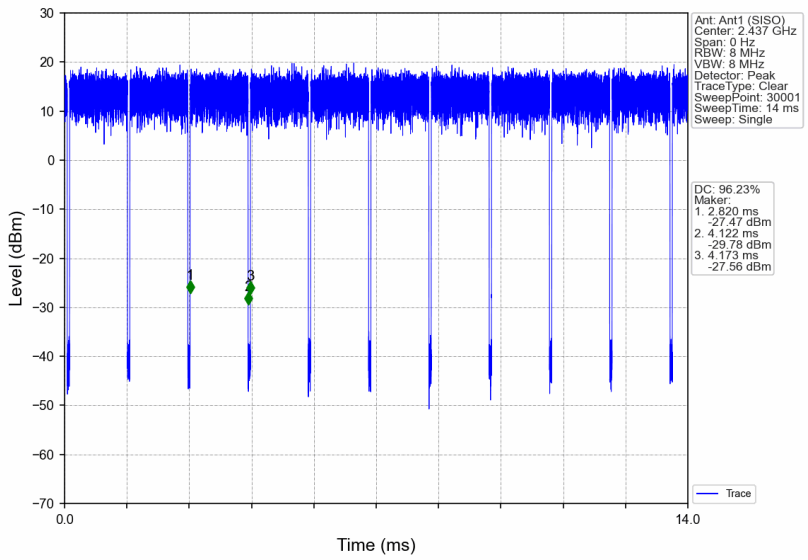


No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300 t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
中国・江苏・昆山市留学生创业园伟业路10号 邮编 215300 t(86-512)57355888 f(86-512)57370818 sgs.china@sgs.com

802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



No.10, Weiye Road, Innovation Park, Kunshan, Jiangsu, China 215300 t(86-512)57355888 f(86-512)57370818 www.sgsgroup.com.cn
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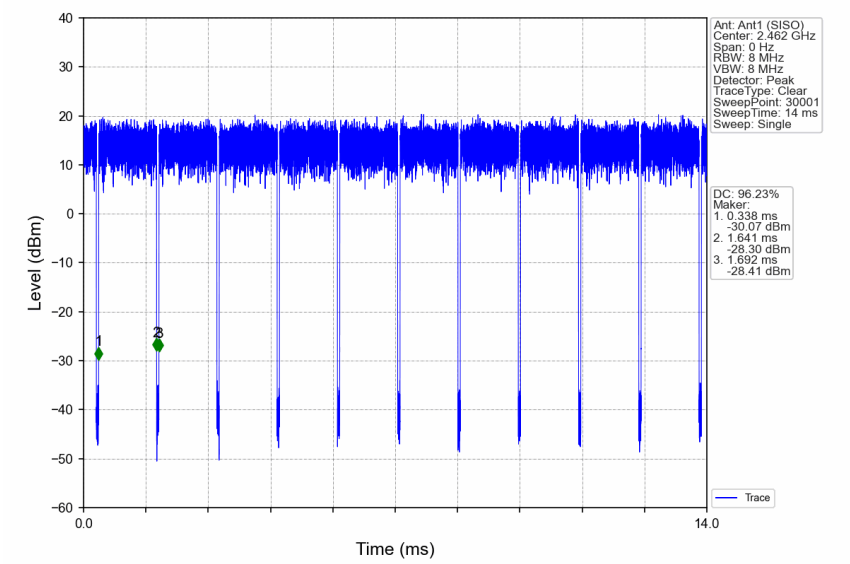
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)	Verdict
				Result	
802.11b	SISO	2412	1	13.419	Pass
		2437	1	13.382	Pass
		2462	1	13.406	Pass
802.11g	SISO	2412	1	17.325	Pass
		2437	1	17.361	Pass
		2462	1	17.283	Pass
802.11n (HT20)	SISO	2412	1	18.107	Pass
		2437	1	18.178	Pass
		2462	1	18.090	Pass

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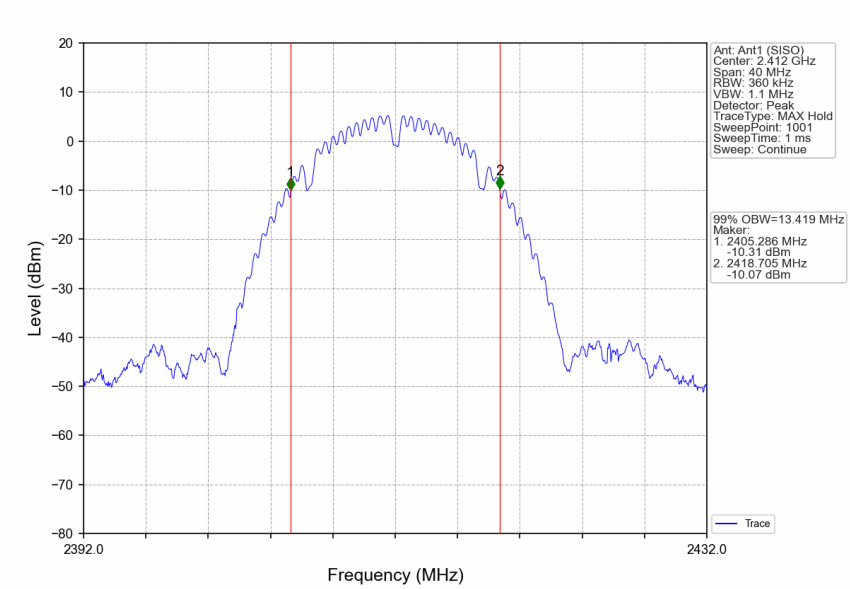
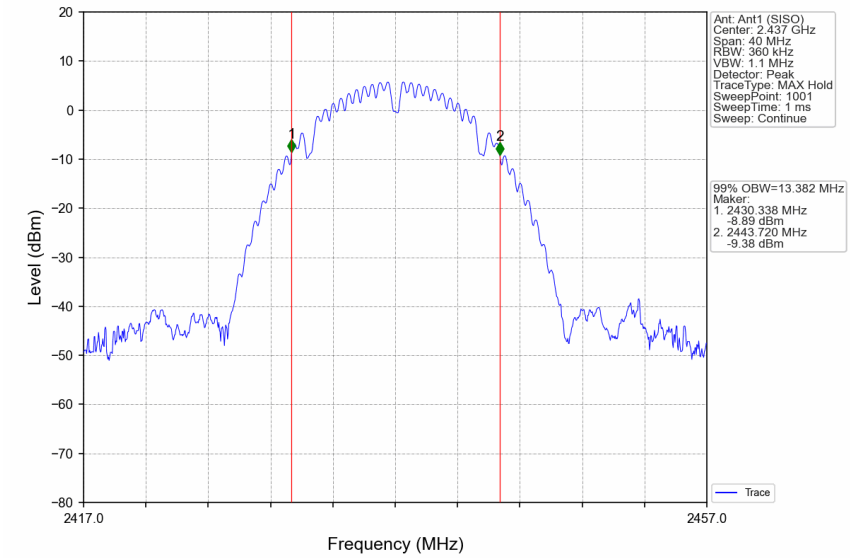
2.1.2 Test Graph

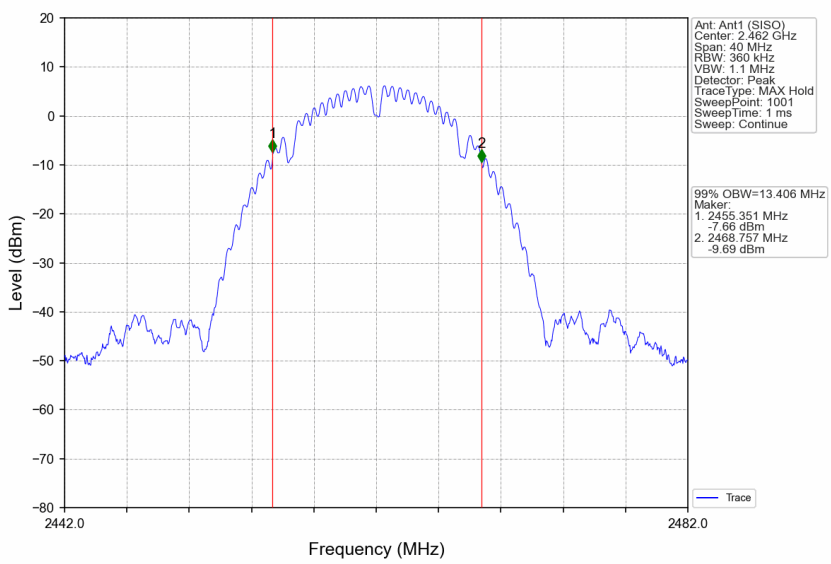
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



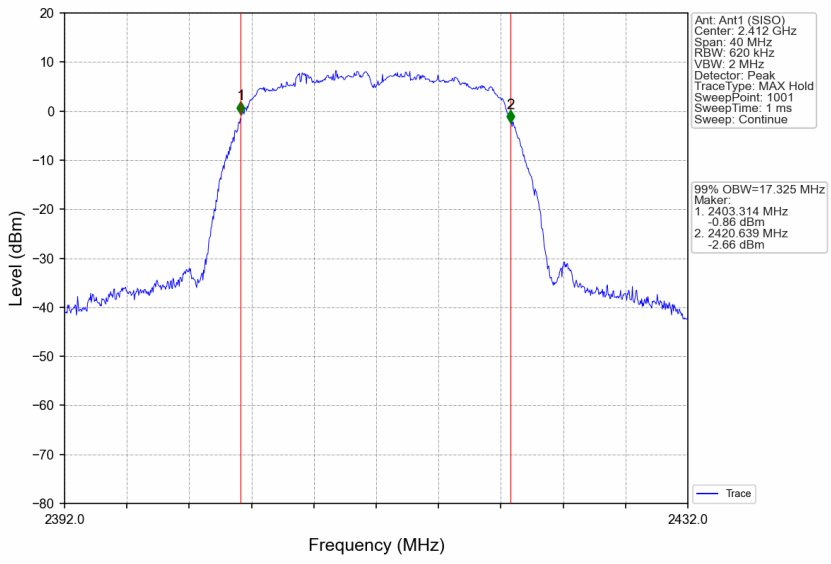
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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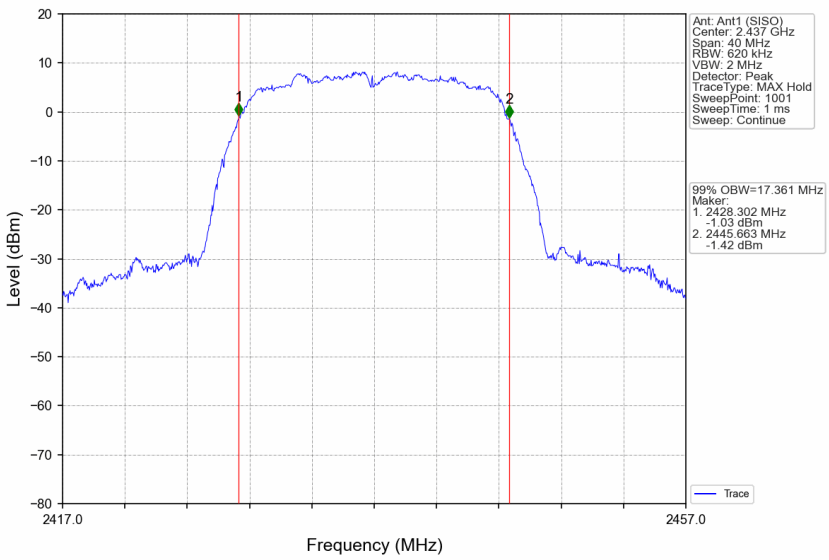
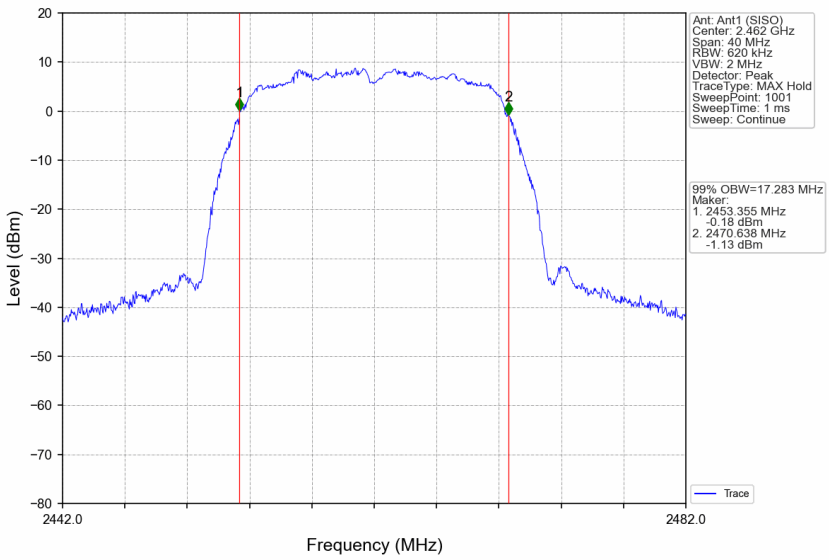
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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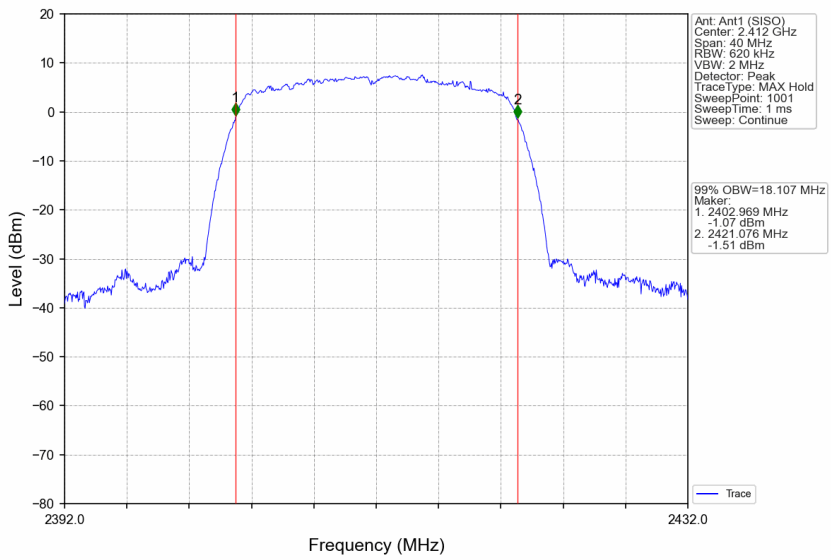
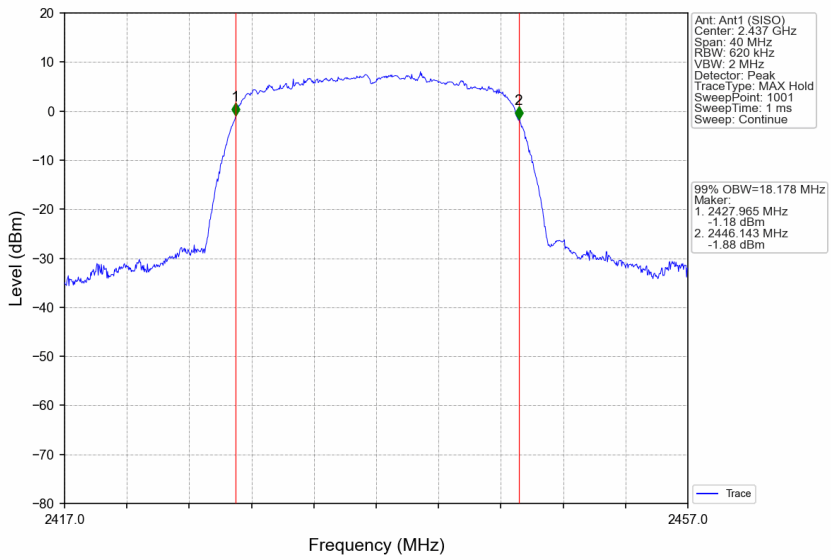
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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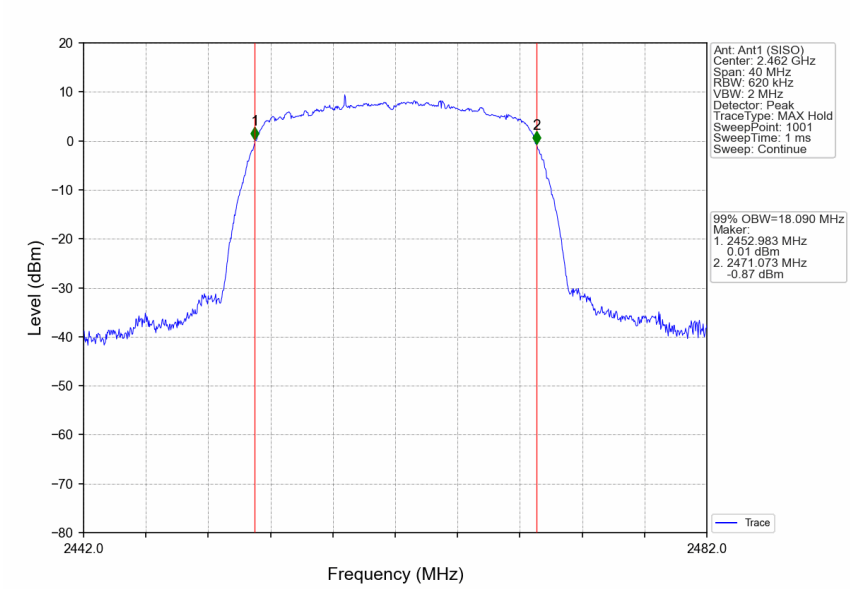
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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2.2 6dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	9.069	>=0.5	Pass
		2437	1	8.137	>=0.5	Pass
		2462	1	9.092	>=0.5	Pass
802.11g	SISO	2412	1	15.154	>=0.5	Pass
		2437	1	15.157	>=0.5	Pass
		2462	1	15.161	>=0.5	Pass
802.11n (HT20)	SISO	2412	1	15.140	>=0.5	Pass
		2437	1	15.169	>=0.5	Pass
		2462	1	15.145	>=0.5	Pass

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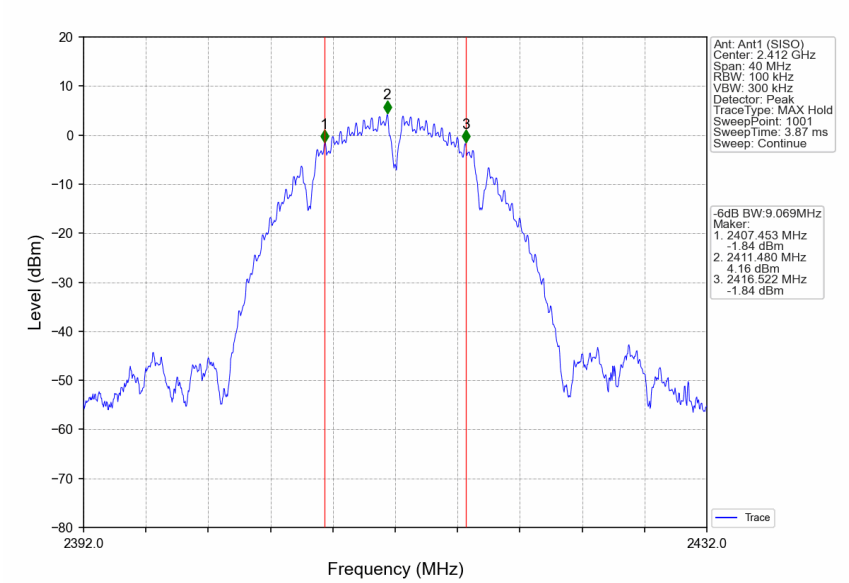
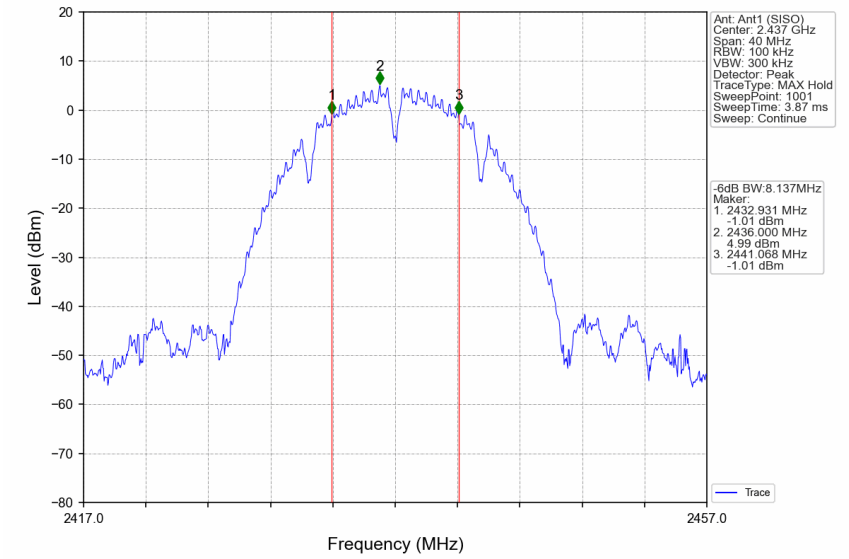
2.2.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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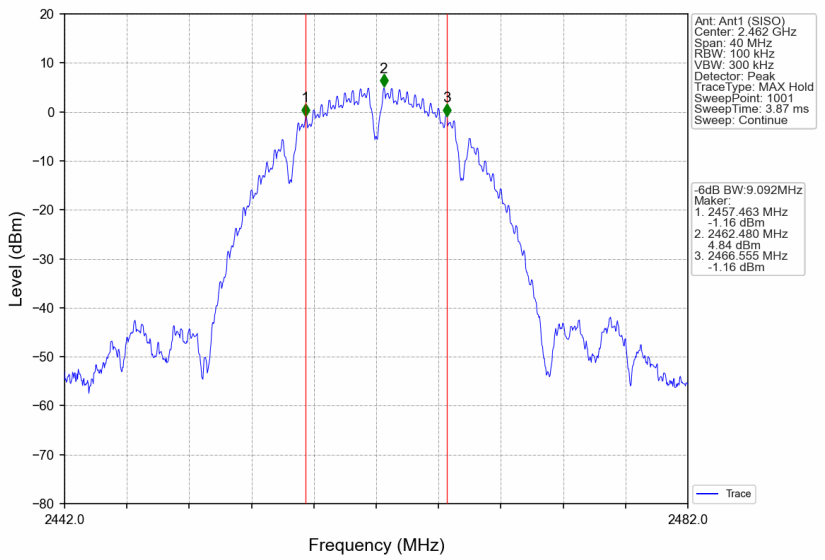
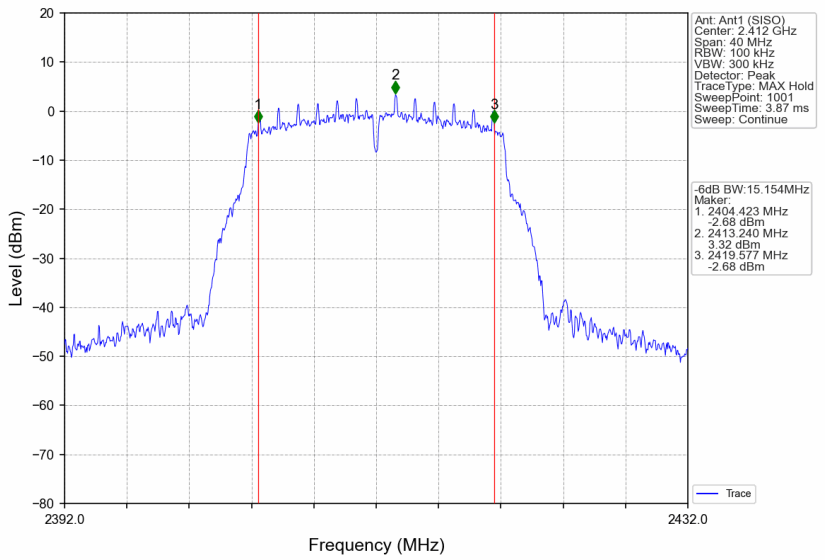
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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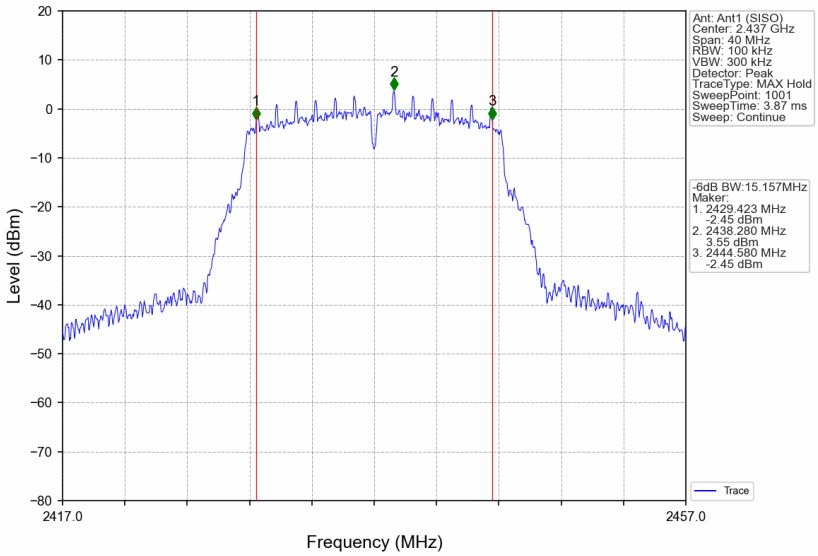
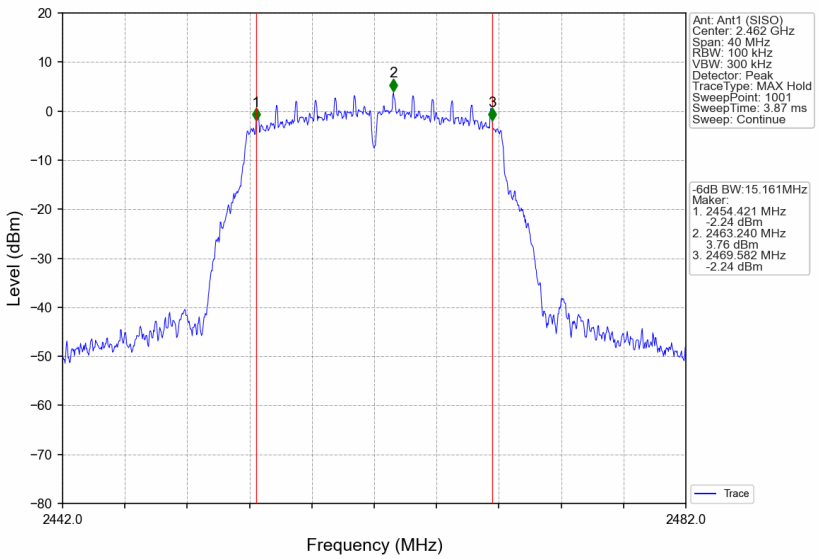
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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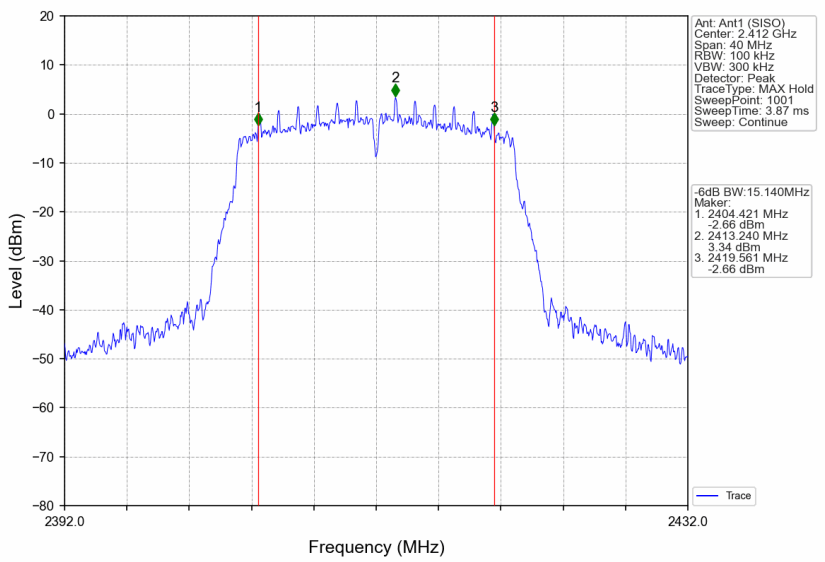
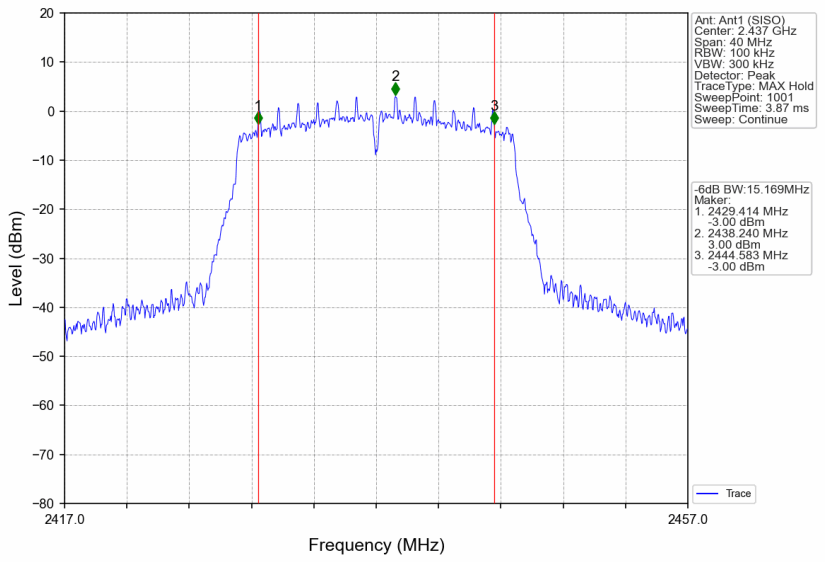
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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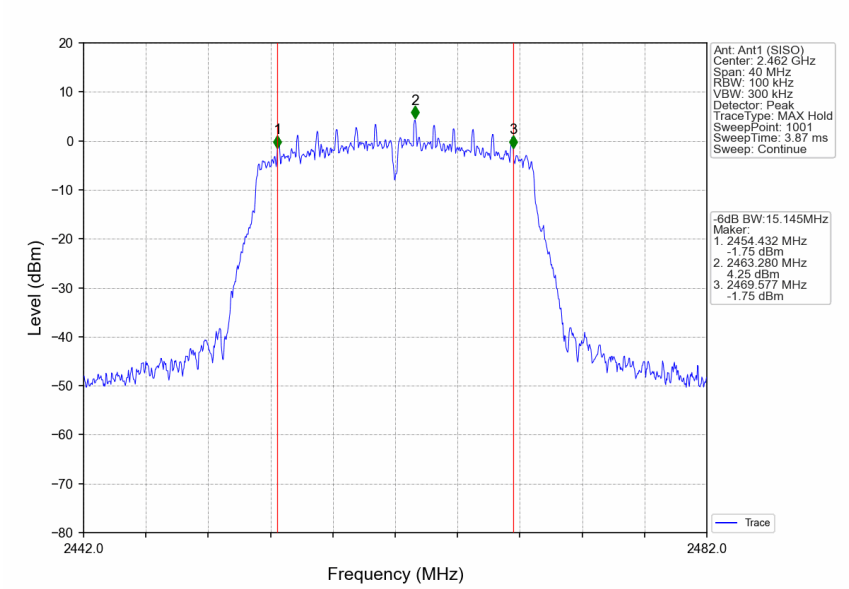
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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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)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	13.06	<=30	Pass
		2437	13.63	<=30	Pass
		2462	14.05	<=30	Pass
802.11g	SISO	2412	13.03	<=30	Pass
		2437	13.18	<=30	Pass
		2462	13.74	<=30	Pass
802.11n (HT20)	SISO	2412	12.94	<=30	Pass
		2437	13.01	<=30	Pass
		2462	13.67	<=30	Pass
Note1: Antenna Gain: Ant1: 3.83dBi;					

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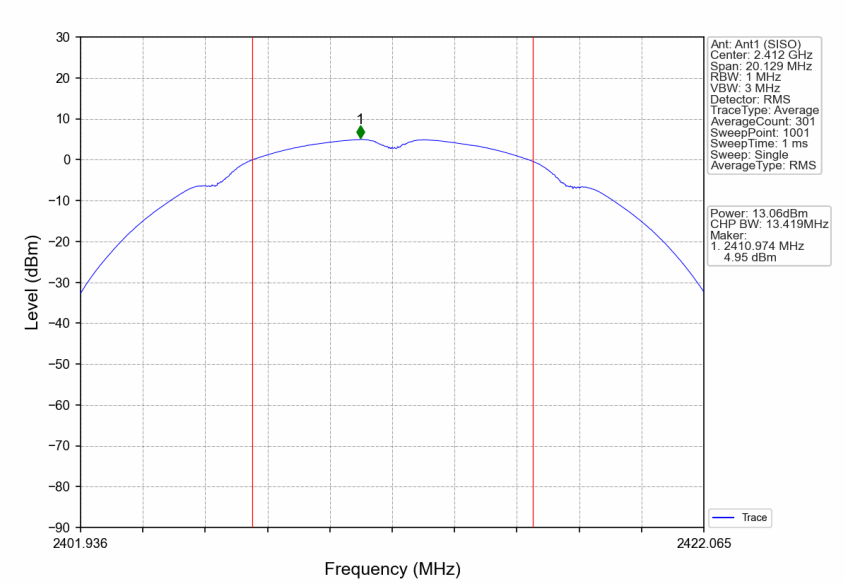
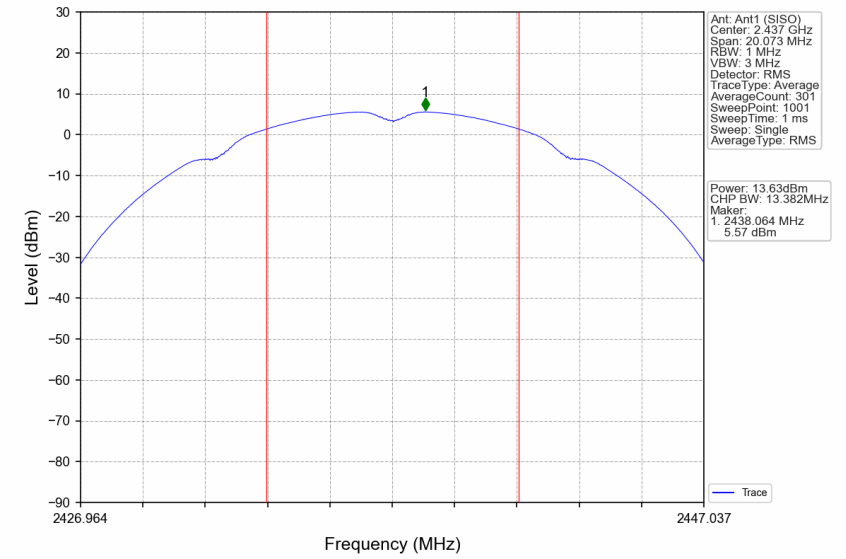
3.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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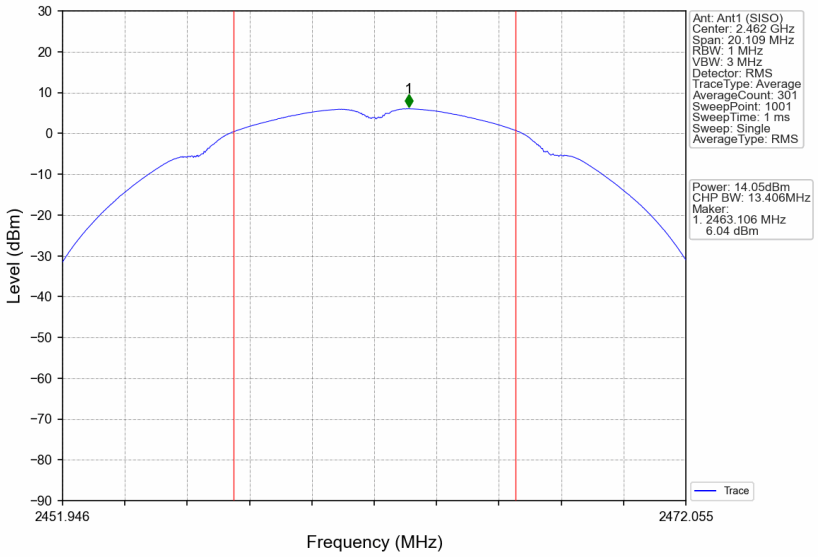
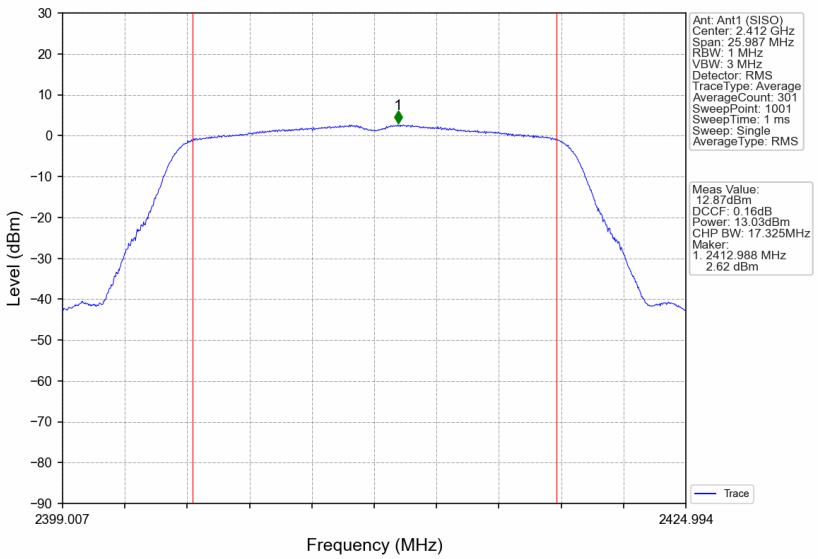
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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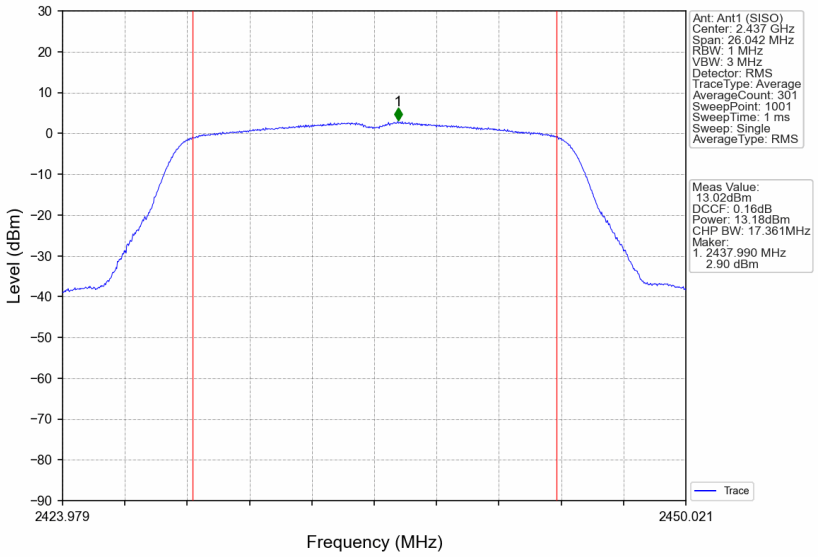
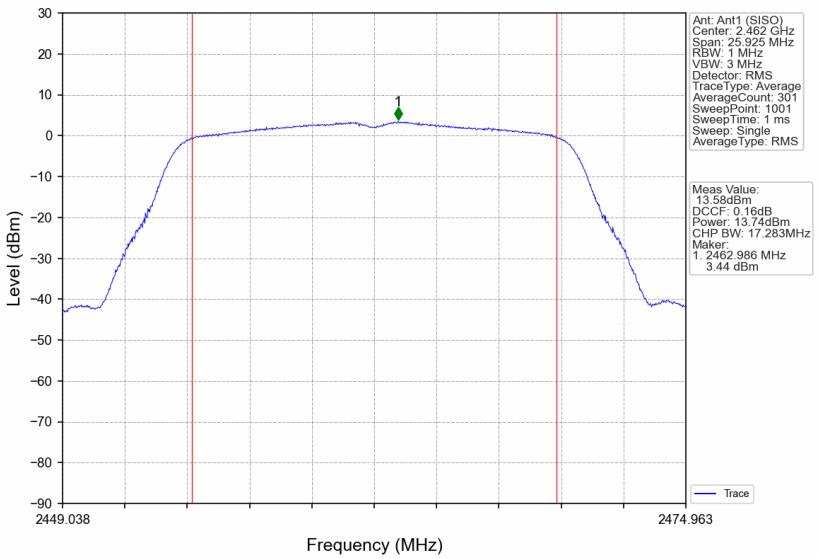
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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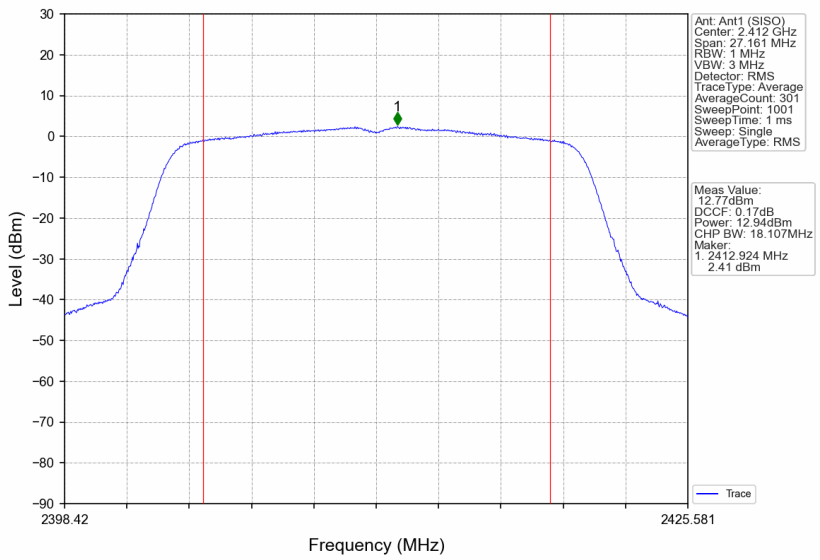
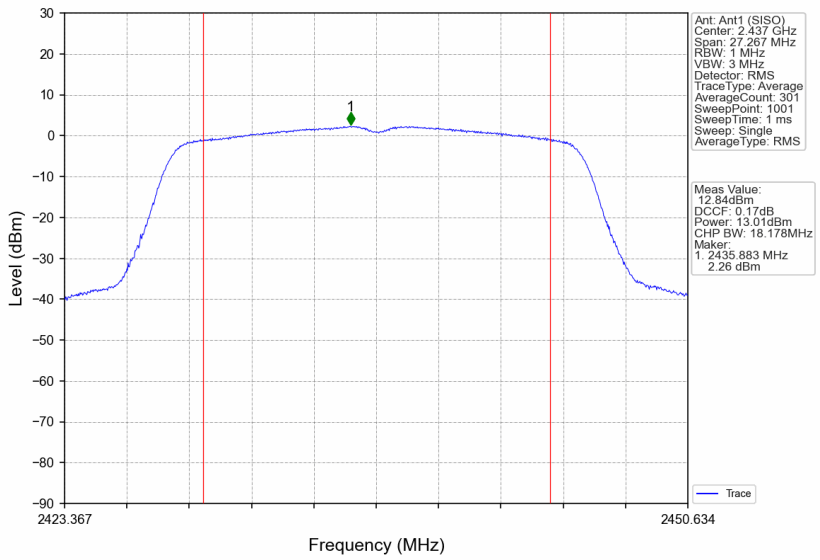
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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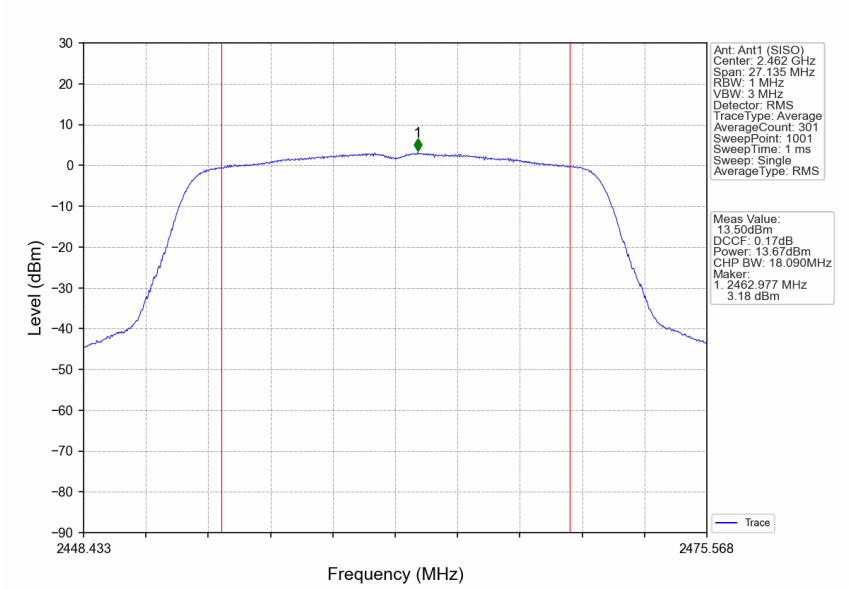
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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4. Maximum Power Spectral Density

4.1 PSD

4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	1.91	<=8	Pass
		2437	-2.90	<=8	Pass
		2462	1.94	<=8	Pass
802.11g	SISO	2412	-12.04	<=8	Pass
		2437	-13.28	<=8	Pass
		2462	-11.88	<=8	Pass
802.11n (HT20)	SISO	2412	-13.58	<=8	Pass
		2437	-14.22	<=8	Pass
		2462	-12.87	<=8	Pass
Note1: Antenna Gain: Ant1: 3.83dBi;					

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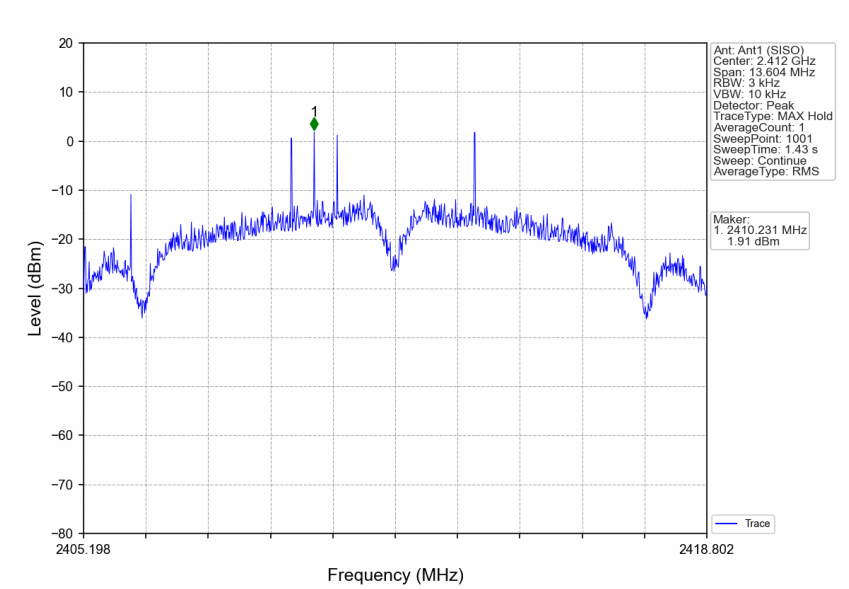
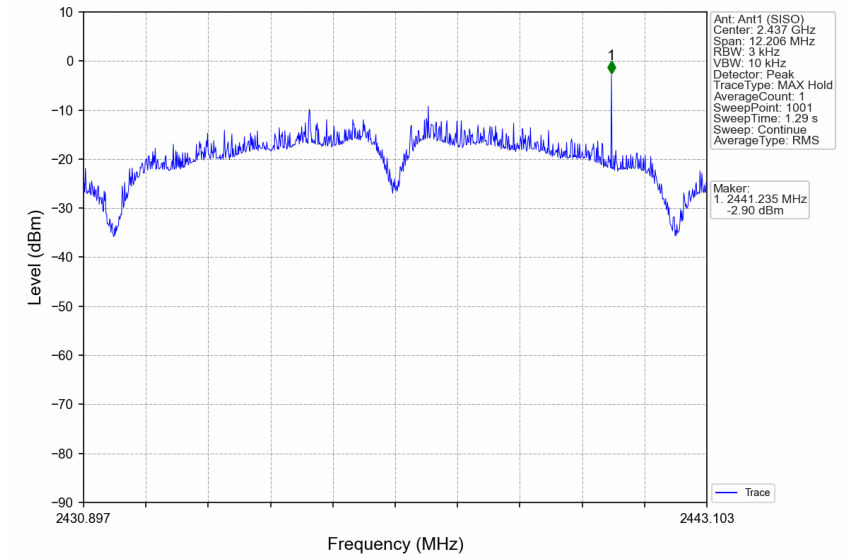
4.1.2 Test Graph

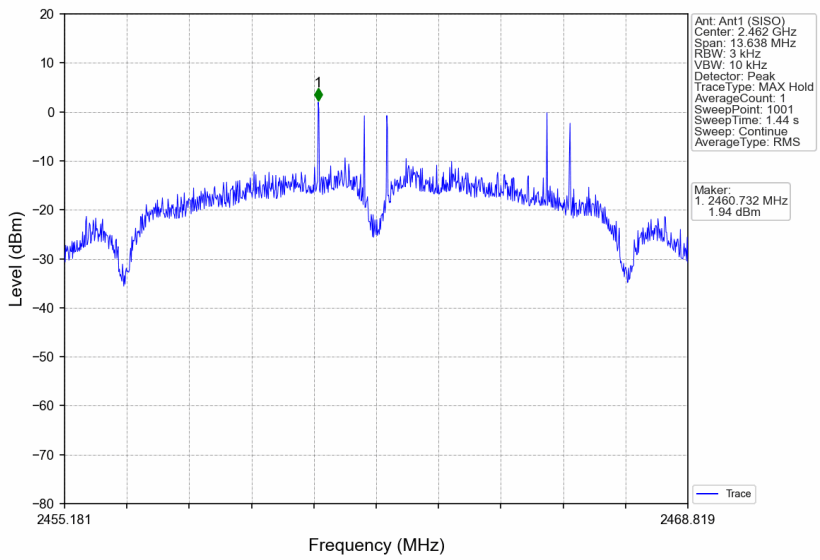
802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



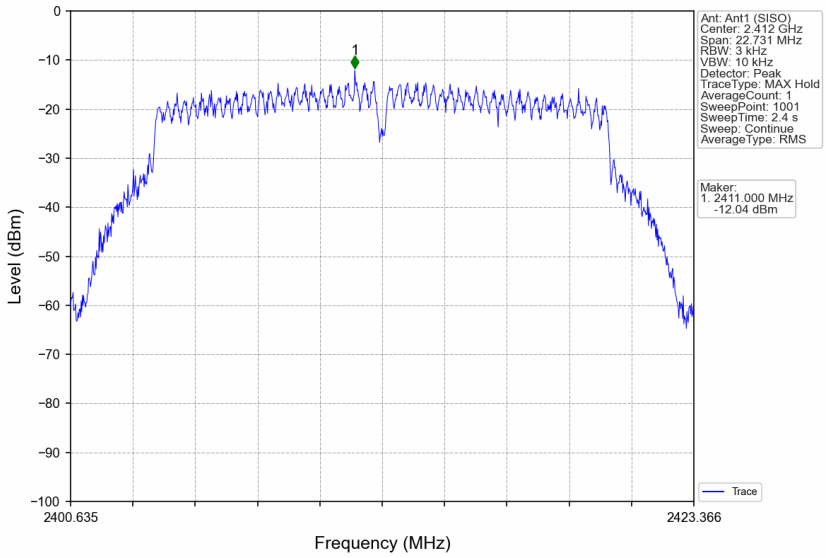
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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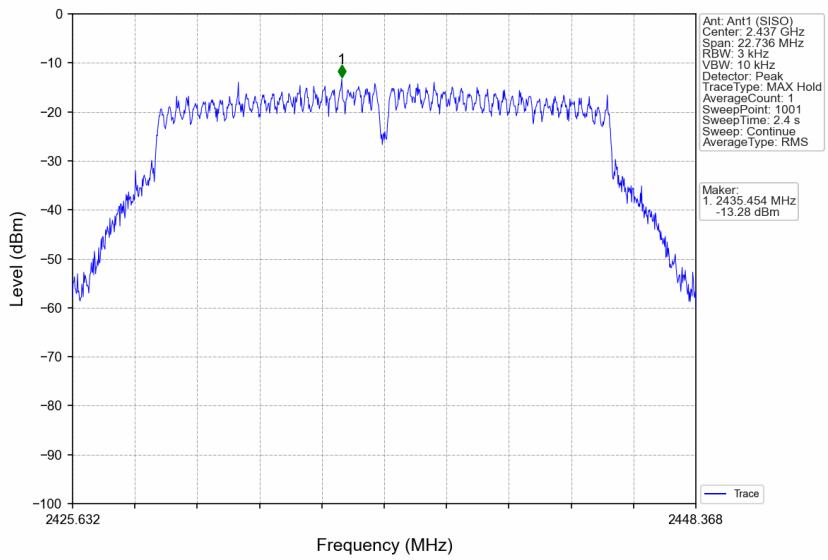
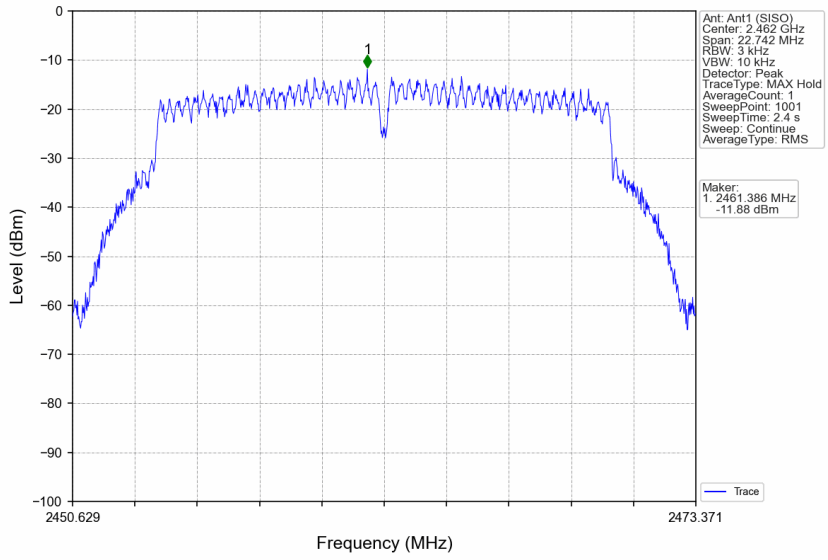
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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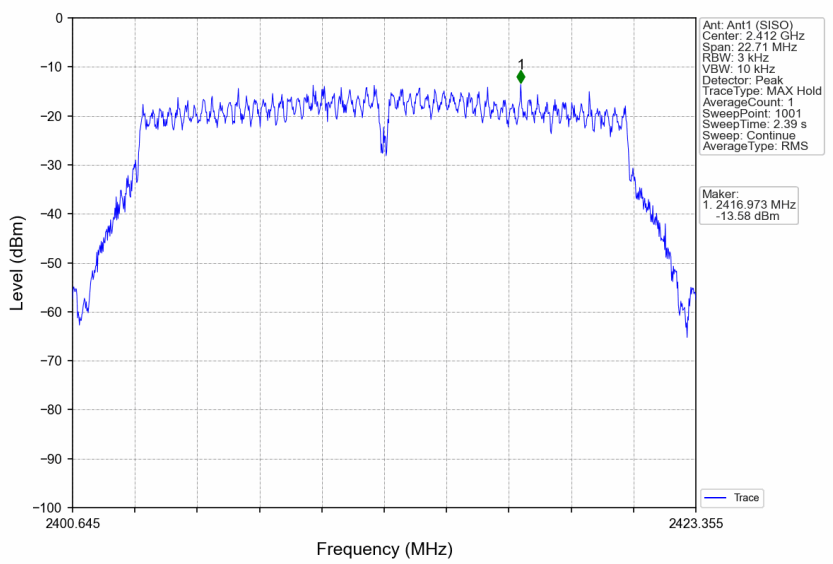
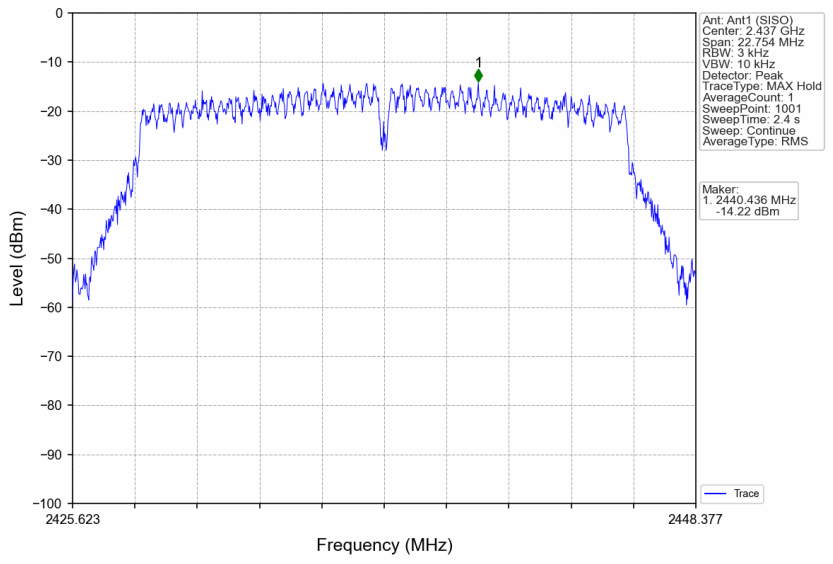
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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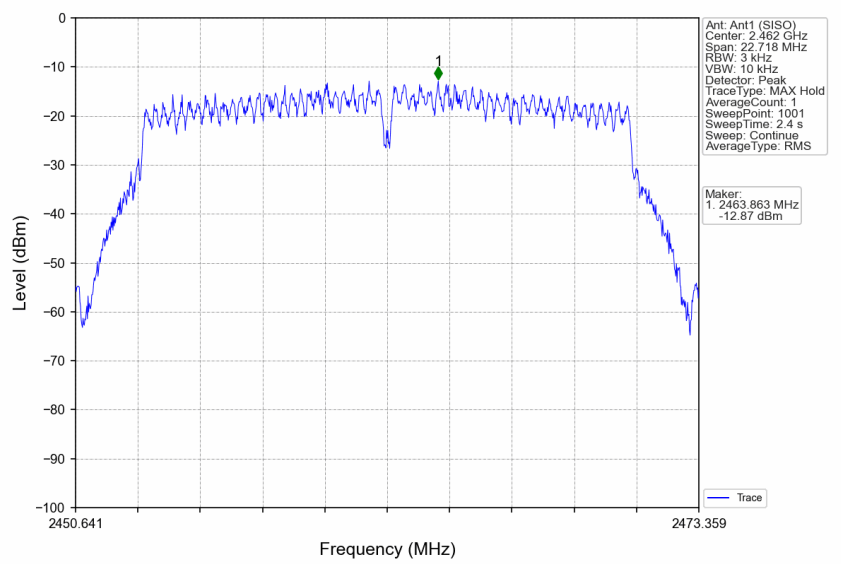
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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5. Unwanted Emissions InStandard Non-restricted Frequency Bands

5.1 Ref

5.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	4.04
		2437	1	4.44
		2462	1	4.81
802.11g	SISO	2412	1	3.28
		2437	1	3.44
		2462	1	4.25
802.11n (HT20)	SISO	2412	1	3.42
		2437	1	3.50
		2462	1	3.89
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.				

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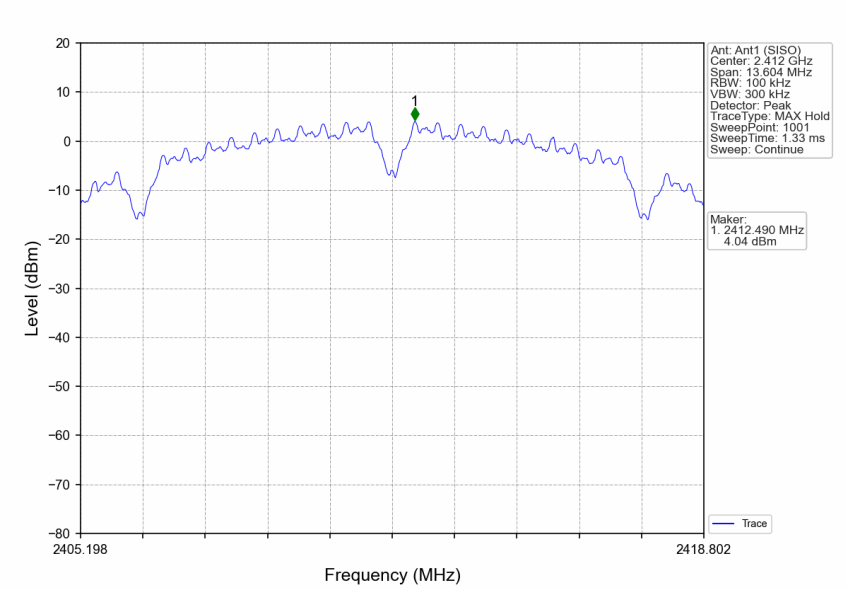
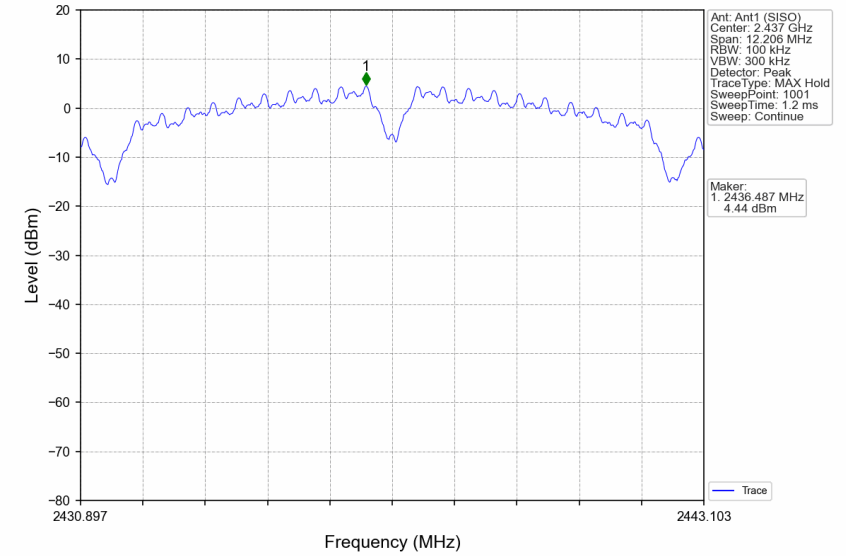
5.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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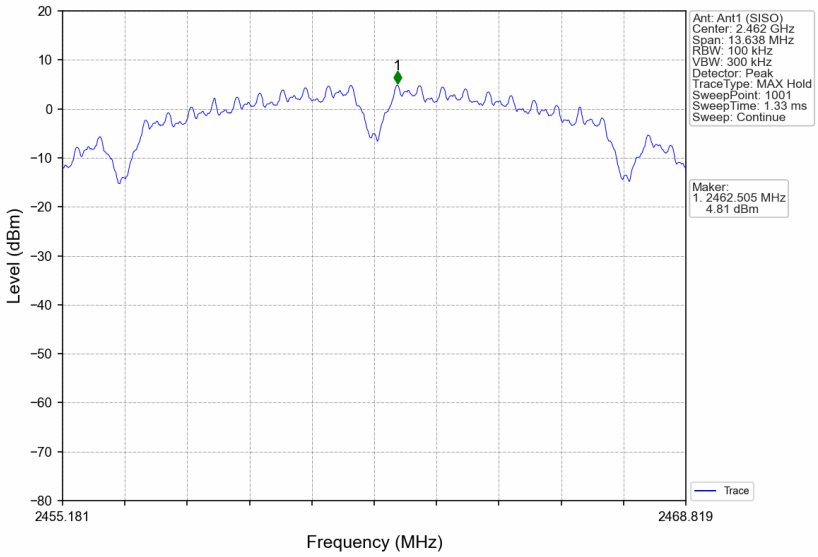
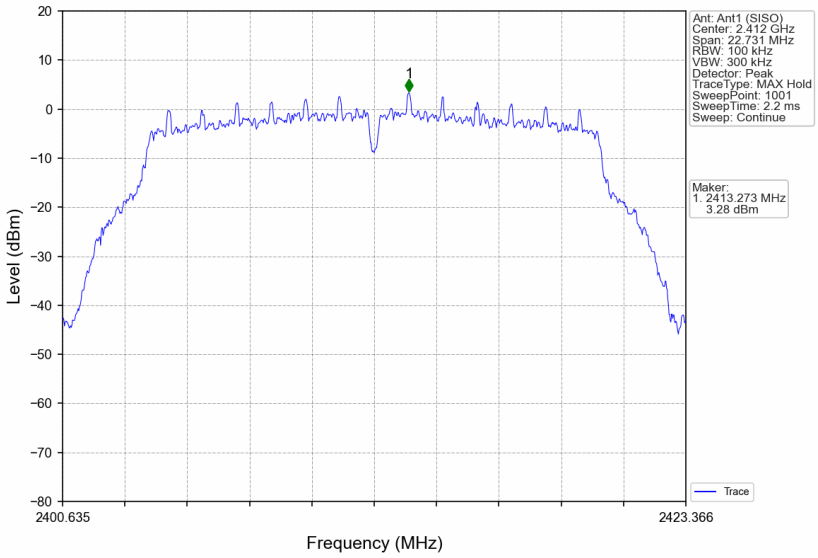
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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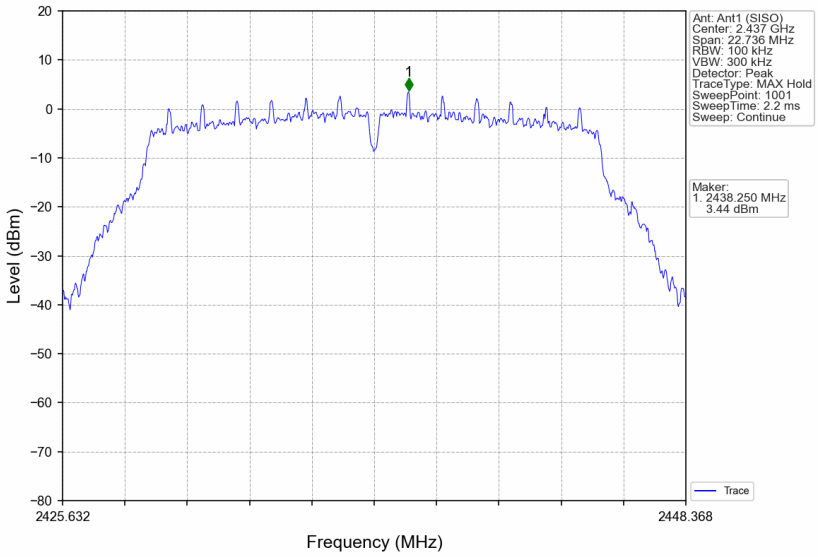
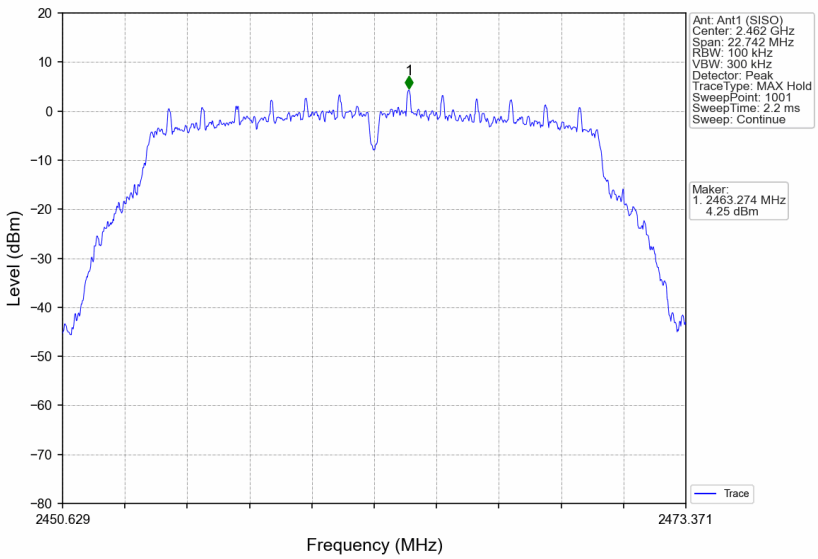
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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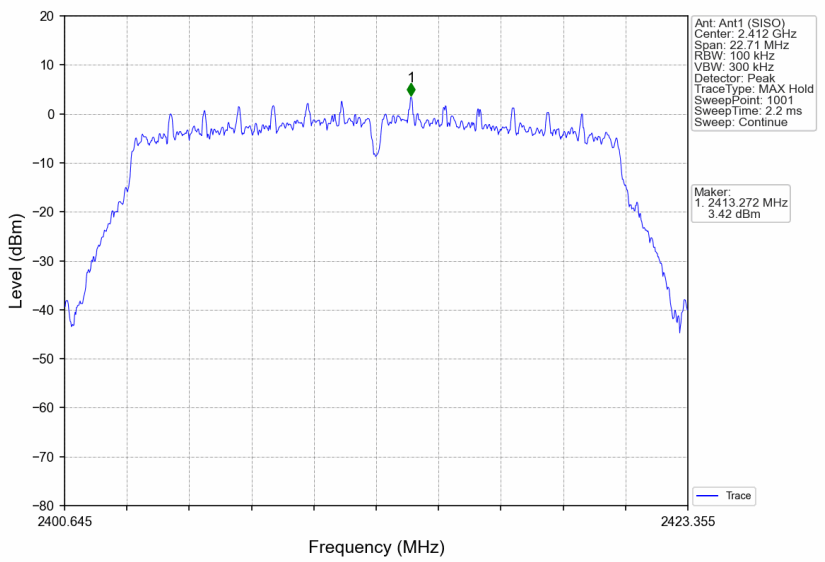
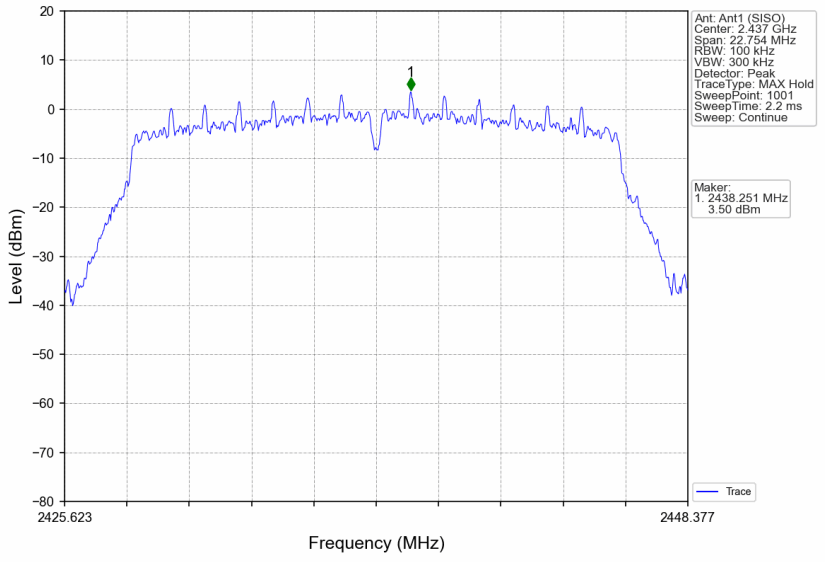
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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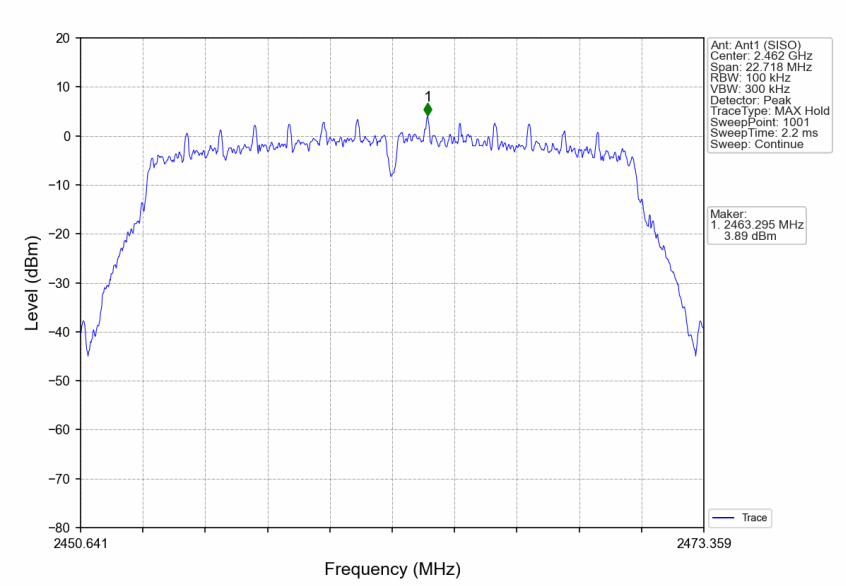
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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5.2 CSE

5.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	4.81	-25.19	Pass
		2437	1	4.81	-25.19	Pass
		2462	1	4.81	-25.19	Pass
802.11g	SISO	2412	1	4.25	-25.75	Pass
		2437	1	4.25	-25.75	Pass
		2462	1	4.25	-25.75	Pass
802.11n (HT20)	SISO	2412	1	3.89	-26.11	Pass
		2437	1	3.89	-26.11	Pass
		2462	1	3.89	-26.11	Pass
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.						

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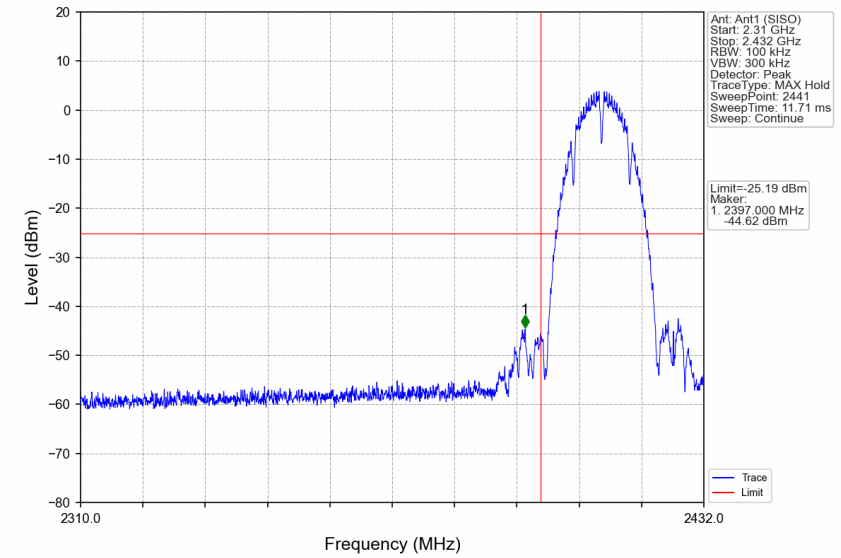
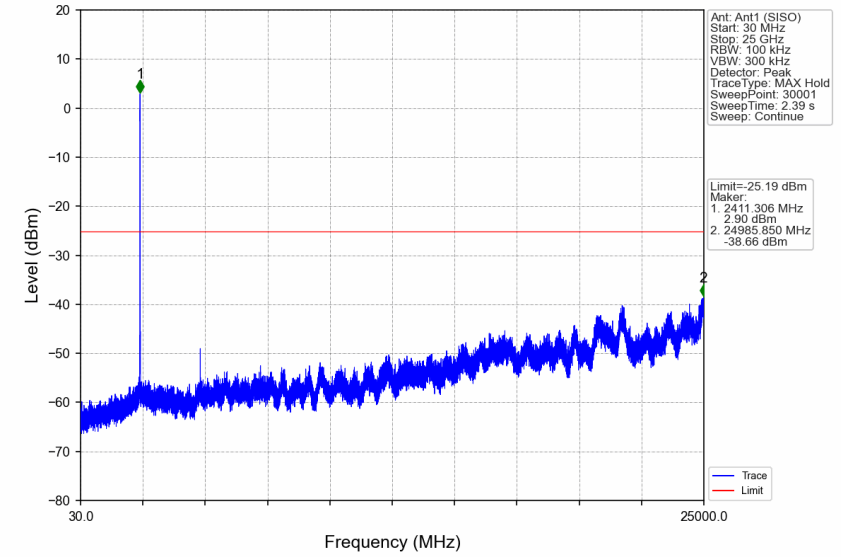
5.2.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



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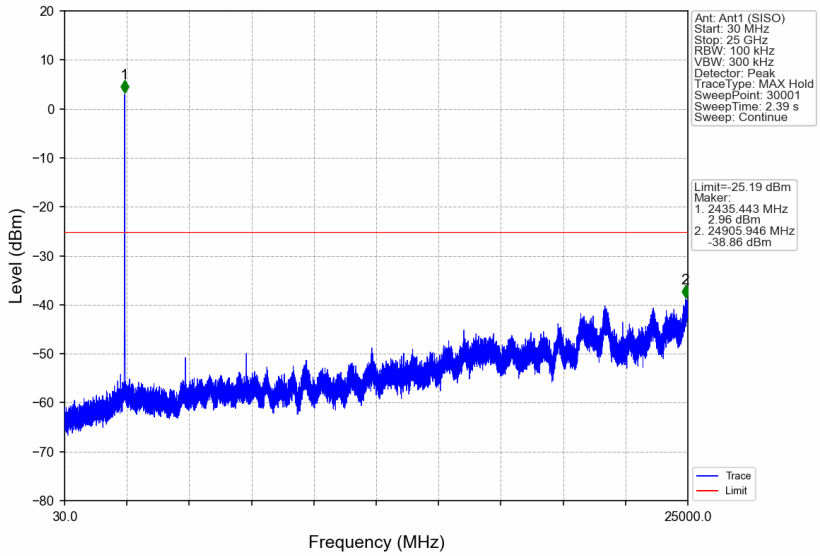
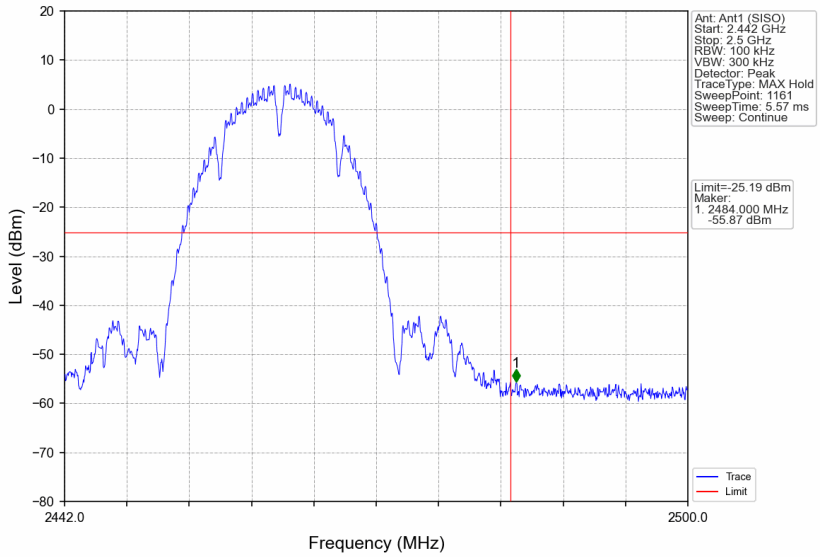
802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



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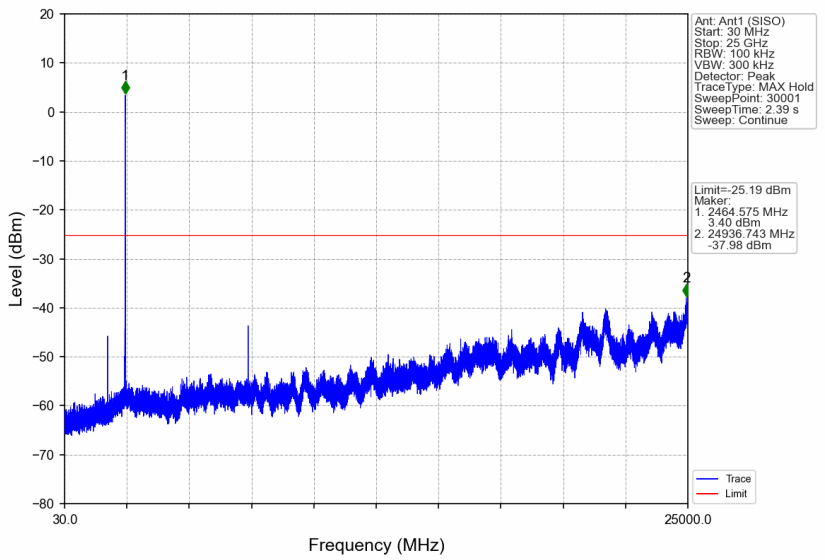
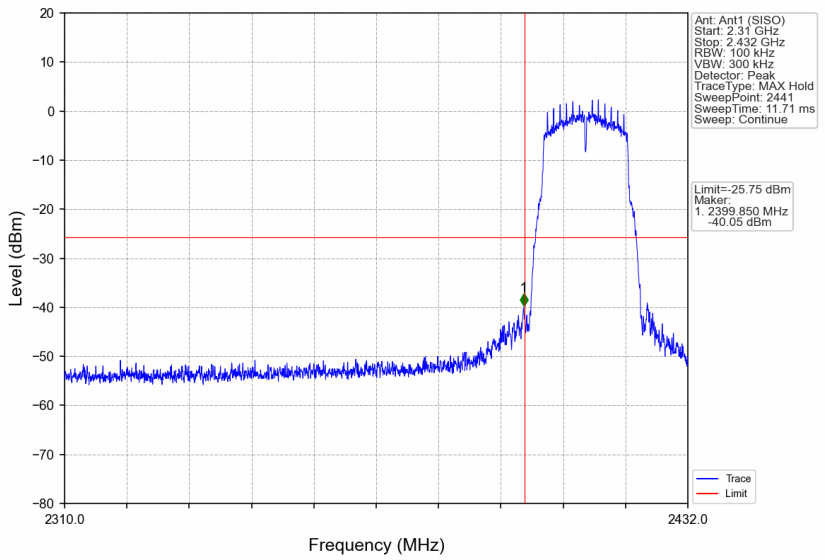
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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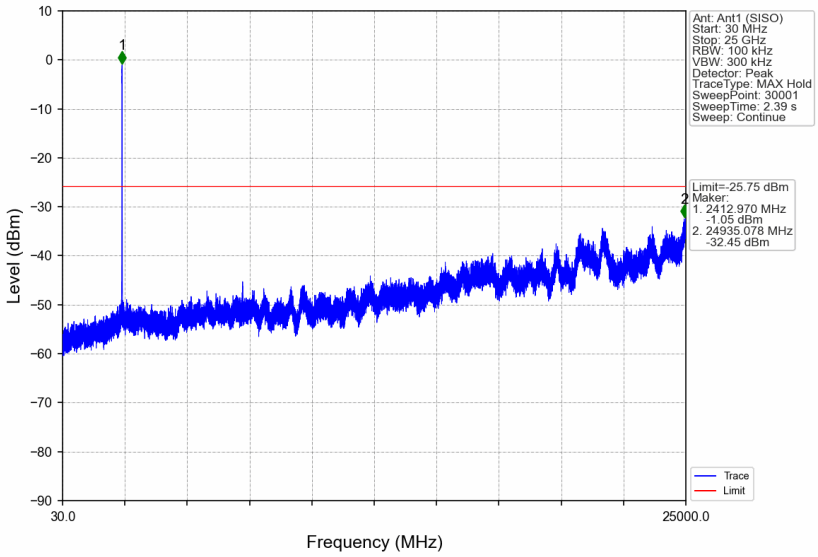
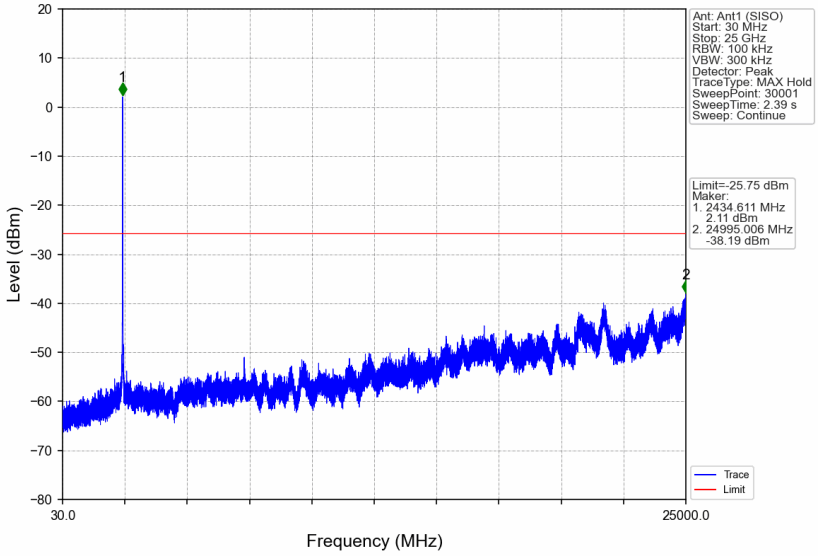
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



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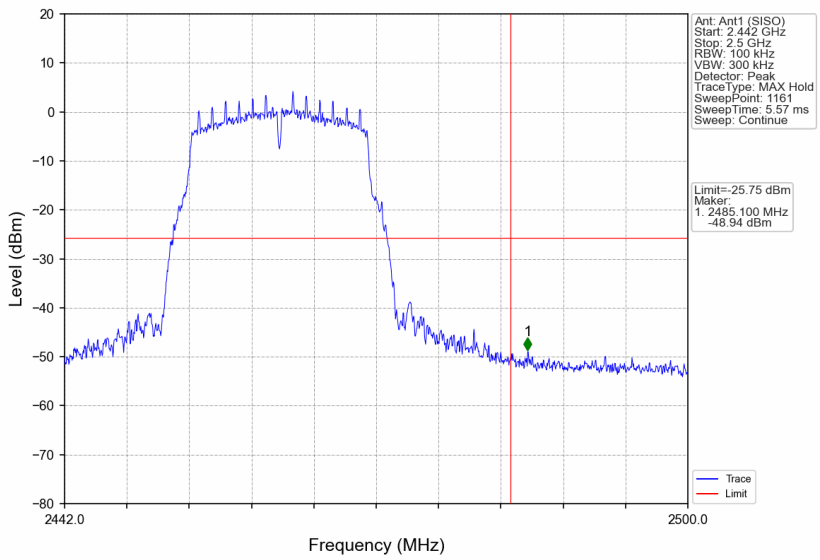
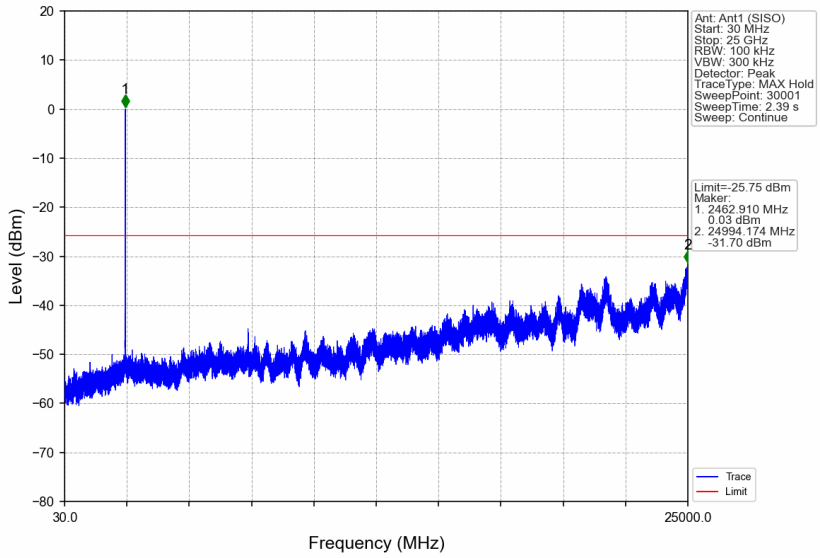
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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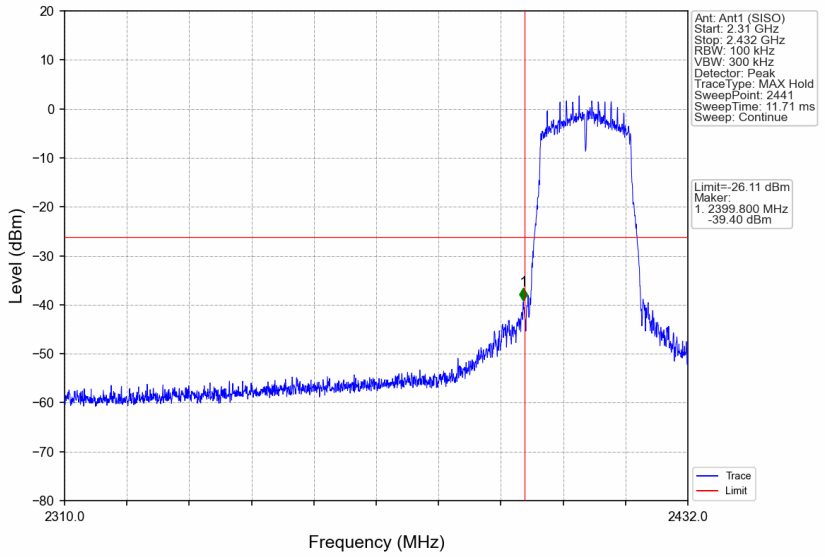
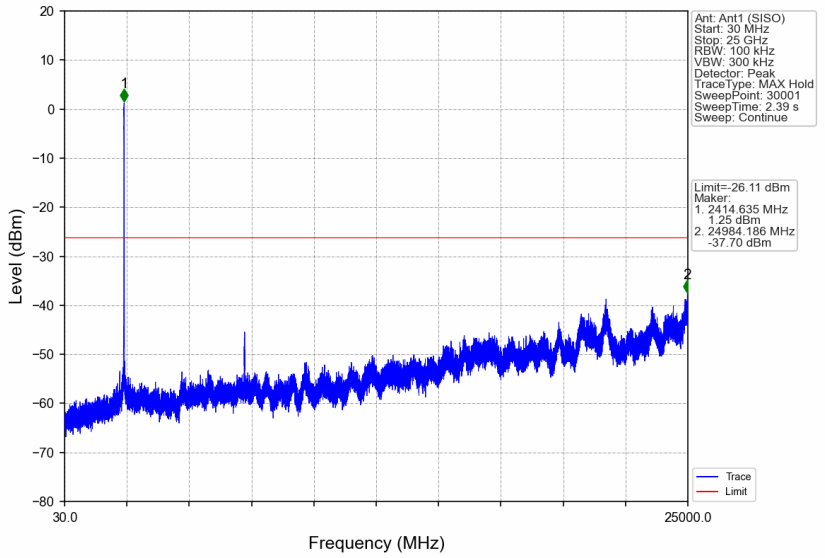
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



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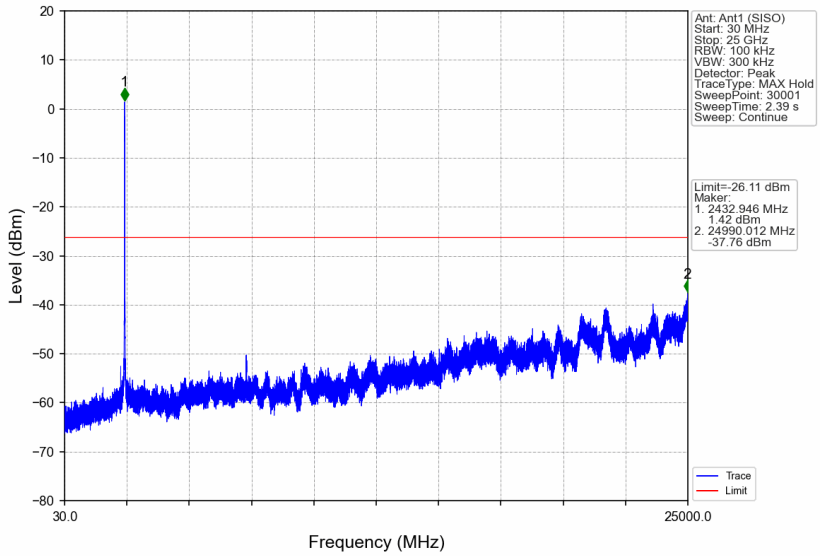
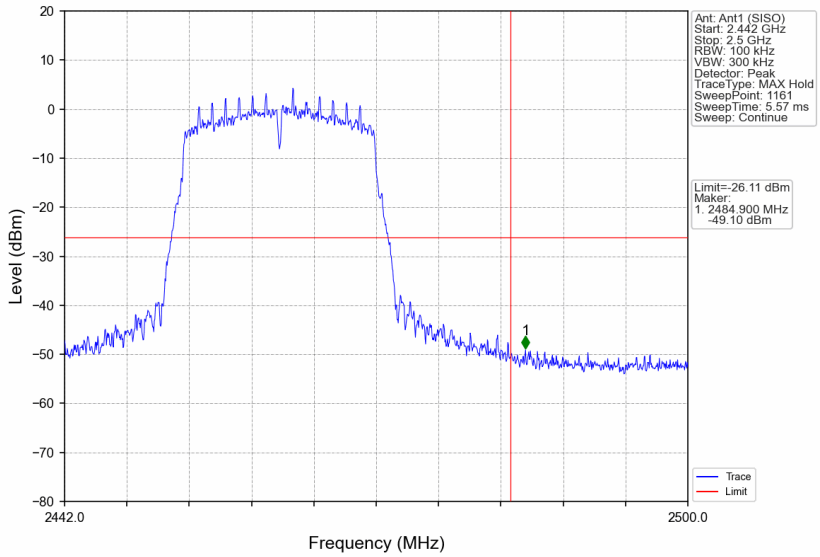
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



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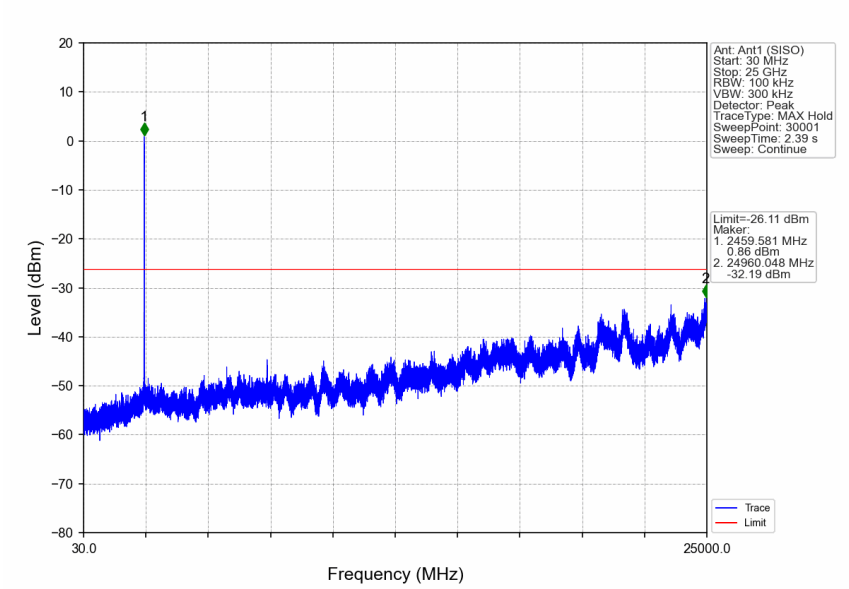
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



- End of the Report -

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