

TEST REPORT

Application No.: SZCR2511005167WM
Applicant: TCL Communication Ltd.
Address of Applicant: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Manufacturer: TCL Communication Ltd.
Address of Manufacturer: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Equipment Under Test (EUT):
EUT Description: GSM/UMTS/LTE/NR Mobile phone
Model No.: T523P
FCC ID: 2ACCJH203
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2025-11-24
Date of Test: 2025-12-03 to 2025-12-30
Date of Issue: 2026-01-07

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Kenx. Xu

Kenx Xu
EMC Laboratory Manager



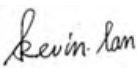
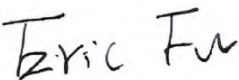


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SZEMC-TRF-01 Rev. A/2

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2026-01-07		Original

Authorized for issue by:				
				
		Kevin Lan/Project Engineer		
				
		Eric Fu/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 (2020) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2020) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2020) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2020) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Conducted Peak Output Power		ANSI C63.10 (2020) Section 11.9.2	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2020) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2020) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2020) Section 6.10.4	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2020) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass



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4 General Information

4.1 Details of E.U.T.

EUT Description:	GSM/UMTS/LTE/NR Mobile phone	
Model No.:	T523P	
Hardware Version:	05	
Software Version:	BBSB	
Power Supply:	DC 3.91V from internal rechargeable battery which can be charge by AC/DC adapter	
Operation Frequency:	802.11b/g/n(HT20):	2412MHz to 2462MHz
	802.11n(HT40):	2422MHz to 2452MHz
Modulation Type:	802.11b:	DSSS (DBPSK, DQPSK, CCK)
	802.11g/n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Number of Channels:	802.11b/g/n(HT20): 11 802.11n(HT40): 7	
Channel Spacing:	5MHz	
Smart System:	☒ SISO	802.11b/g/n
	☐ MIMO	CDD: 802.11b/g/n: Tx & Rx
		STBC: 802.11n: Tx & Rx
		TXBF: 802.11n: Tx & Rx
	☐ Diversity	802.11b/g : Tx & Rx
Antenna Type:	FPC Antenna	
Antenna Gain:	-4.55dBi(Ant7)	
	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
RF Cable:	2000MHz ~ 3000MHz (1.1dB)	
Remark:	As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.	



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4.2 Environment Parameter

Environment Parameter	1020 mbar Selected Values During Tests	
Relative Humidity	47.5-64.3 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	21.6~24.5	3.91
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		

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
--	--	--	--
The EUT has been tested as an independent unit.			

4.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	± 3.2dB
Radiated Emissions which fall in the restricted bands	± 6.0dB (Below 1GHz); ± 4.6dB (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	± 6.0dB for 3m; ± 5.0dB for 10m
Radiated Spurious Emissions Above 1GHz	± 4.6dB (1-18GHz); ± 4.8dB (18-40GHz)
Conducted Peak Output Power	± 0.4dB
Minimum 6dB Bandwidth	± 0.3%
Power Spectrum Density	± 0.4dB
Conducted Band Edges Measurement	± 2.7dB
Conducted Spurious Emissions	± 2.7dB

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{CISPR/ETSI}$ (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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4.5 Test Location

All tests were performed at:

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Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

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

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2025-05-07	2028-05-06
EMI Test Receiver	Rohde&Schwarz	ESR	SZ-WRG-M-047	2025-01-08	2026-01-07
Measurement Software	AUDIX	e3 V8.2014-6-27a	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2025-07-05	2026-07-04
LISN	Rohde&Schwarz	ENV216	SEM007-01	2025-07-25	2026-07-24
LISN	ETS-LINDGREN	3816/2	SEM007-02	2025-03-03	2026-03-02

Radiated Emissions which fall in the restricted bands					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Signal & Spectrum Analyzer	Rohde & Schwarz	FSV	SZ-WRG-M-048	2025-01-07	2026-01-06
Low Noise Amplifier 30M-8GHz	Tonscend	TAP30M8G30	SZ-WRG-M-050	2025-01-07	2026-01-06
Double Ridge Horn Antenna 1GHz-18GHz	SCHWARZBECK	BBHA 9120 D	SZ-WRG-M-055	2023-12-21	2025-12-20
				2025-12-13	2026-12-12
RSE Test Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Chamber	CRTSGSSAC966	N/A	SZ-WRG-C-063	2025-01-06	2028-01-05
Humidity and Temperature Indicator	deli	8838	SEM002-46	2025-07-23	2026-07-22

Radiated Spurious Emissions Below 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2025-11-17	2027-11-16
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2023-06-19	2026-06-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2025-07-25	2026-07-24
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2025-08-29	2027-08-28
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2025-03-04	2026-03-03
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2025-07-05	2026-07-04



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Radiated Spurious Emissions Above 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Signal & Spectrum Analyzer	Rohde & Schwarz	FSV	SZ-WRG-M-048	2025-01-07	2026-01-06
Low Noise Amplifier 1G-18GHz	Tonscend	TAP01018050	SZ-WRG-M-051	2025-01-07	2026-01-06
Low Noise Amplifier 18G-40GHz	Tonscend	TAP18040048	SZ-WRG-M-052	2025-01-08	2026-01-07
Double Ridge Horn Antenna 1GHz-18GHz	SCHWARZBECK	BBHA 9120 D	SZ-WRG-M-055	2023-12-21	2025-12-20
				2025-12-13	2026-12-12
SHF-EHF Horn 15GHz-40GHz	SCHWARZBECK	BBHA 9170	SZ-WRG-M-056	2023-12-25	2025-12-24
				2025-12-13	2026-12-12
RSE Test Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Chamber	CRTSGSSAC966	N/A	SZ-WRG-C-063	2025-01-06	2028-01-05
Humidity and Temperature Indicator	deli	8838	SEM002-46	2025-07-23	2026-07-22

RF Conducted Test					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Power Sensor	TST PASS	TSPS2023R	SEM009-26	2025-03-04	2026-03-03
Power Sensor	KEYSIGHT	U2021XA	SEM009-16	2025-03-04	2026-03-03
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2025-07-24	2026-07-23
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2025-03-04	2026-03-03
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2025-07-05	2026-07-04
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2025-03-03	2026-03-02

General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2025-07-23	2026-07-22
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2025-07-23	2026-07-22
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2025-03-03	2026-03-02



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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 FPC Antenna and no consideration of replacement. The best case gain of the antenna is -4.55dBi(Ant7).

*Note:

The antenna gain are derived from the gain information report provided by the manufacturer.

Remark:

As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.



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 (2020) Section 6.2

Test Engineer: Wade Li

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: 23.3 °C

Humidity: 48.6 % RH

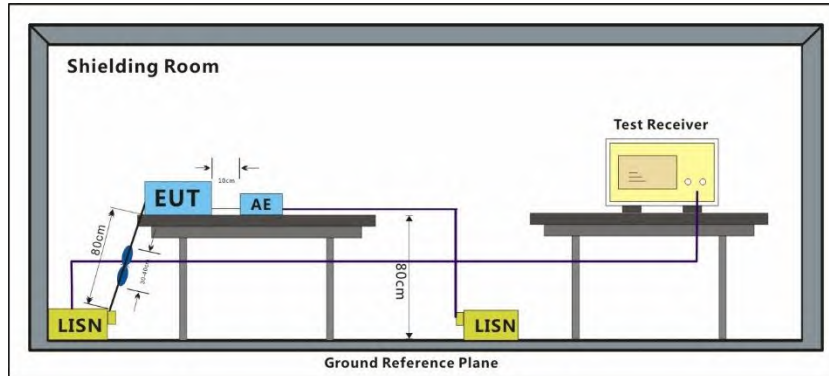
Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.



7.1.3 Test Setup Diagram



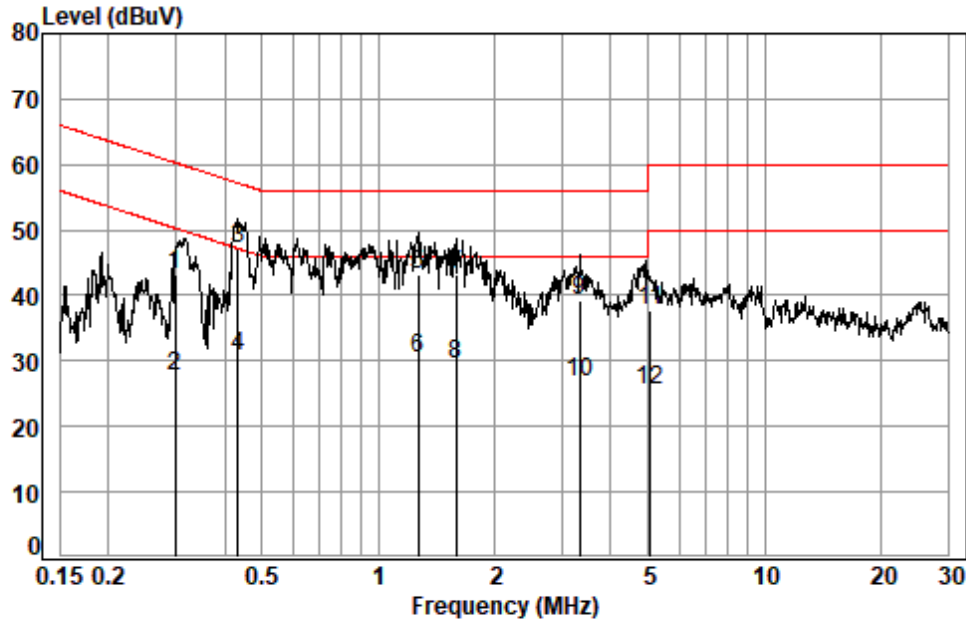
7.1.4 Measurement Procedure and Data

- 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



Test Mode: 03; Line: Live line



Site : Shielding Room

Condition: Line

Job No. : 05167WM

Test mode: 03

: Adapter 1#+USB Cable 1#

	Freq	Cable Loss	LISN Factor	Read Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.2987	0.08	9.85	33.27	43.20	60.28	-17.08 QP
2	0.2987	0.08	9.85	17.62	27.55	50.28	-22.73 Average
3 *	0.4328	0.09	9.63	37.54	47.26	57.20	-9.94 QP
4	0.4328	0.09	9.63	21.10	30.82	47.20	-16.38 Average
5	1.2688	0.11	9.58	33.54	43.23	56.00	-12.77 QP
6 *	1.2688	0.11	9.58	20.63	30.32	46.00	-15.68 Average
7	1.5935	0.12	9.58	33.57	43.27	56.00	-12.73 QP
8	1.5935	0.12	9.58	19.90	29.60	46.00	-16.40 Average
9	3.3281	0.13	9.65	29.32	39.10	56.00	-16.90 QP
10	3.3281	0.13	9.65	16.95	26.73	46.00	-19.27 Average
11	5.0580	0.14	9.66	28.02	37.82	60.00	-22.18 QP
12	5.0580	0.14	9.66	15.80	25.60	50.00	-24.40 Average



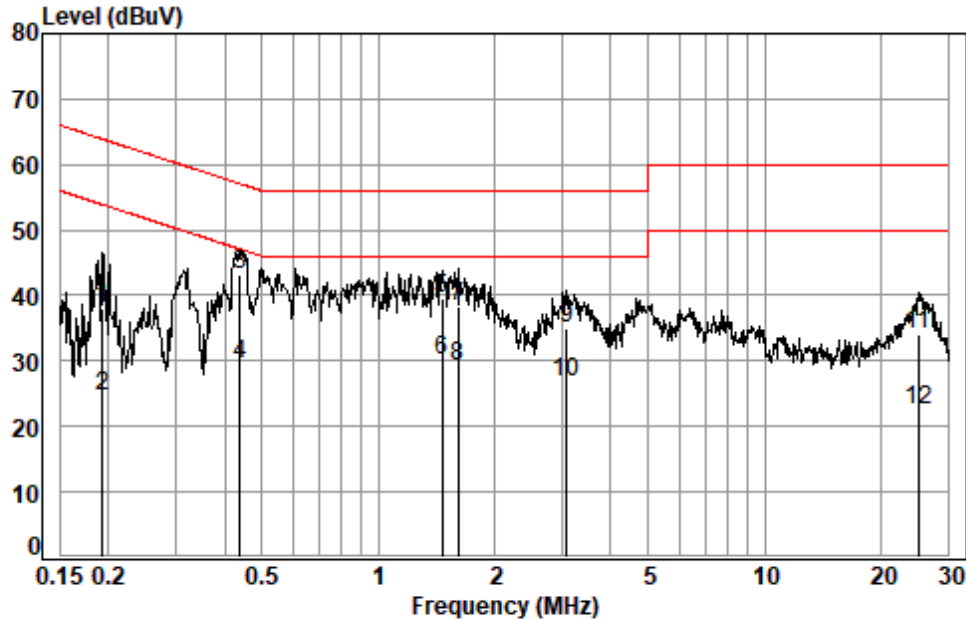
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SZEMC-TRF-01 Rev. A/2

Report No.: SZCR251100516705

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Test Mode: 03; Line: Neutral Line



Site : Shielding Room

Condition: Neutral

Job No. : 05167WM

Test mode: 03

: Adapter 1#+USB Cable 1#

	Cable	LISN	Read	Limit	Over	
Freq	Loss	Factor	Level	Level	Line	Limit Remark
MHz	dB	dB	dBuV	dBuV	dBuV	dB
1	0.1934	0.07	10.09	27.89	38.05	63.89 -25.84 QP
2	0.1934	0.07	10.09	14.50	24.66	53.89 -29.23 Average
3 *	0.4397	0.09	9.73	33.33	43.15	57.07 -13.92 QP
4	0.4397	0.09	9.73	19.79	29.61	47.07 -17.46 Average
5	1.4640	0.12	9.55	29.98	39.65	56.00 -16.35 QP
6 *	1.4640	0.12	9.55	20.53	30.20	46.00 -15.80 Average
7	1.6105	0.12	9.55	28.70	38.37	56.00 -17.63 QP
8	1.6105	0.12	9.55	19.52	29.19	46.00 -16.81 Average
9	3.0738	0.13	9.54	25.28	34.95	56.00 -21.05 QP
10	3.0738	0.13	9.54	17.16	26.83	46.00 -19.17 Average
11	25.0545	0.25	10.44	23.52	34.21	60.00 -25.79 QP
12	25.0545	0.25	10.44	11.85	22.54	50.00 -27.46 Average



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch (Shenzhen) Laboratory

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7.2 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 (2020) Section 6.10.5
 Measurement Distance: 3m
 Test Engineer: Xing Guo

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.

7.2.1 E.U.T. Operation

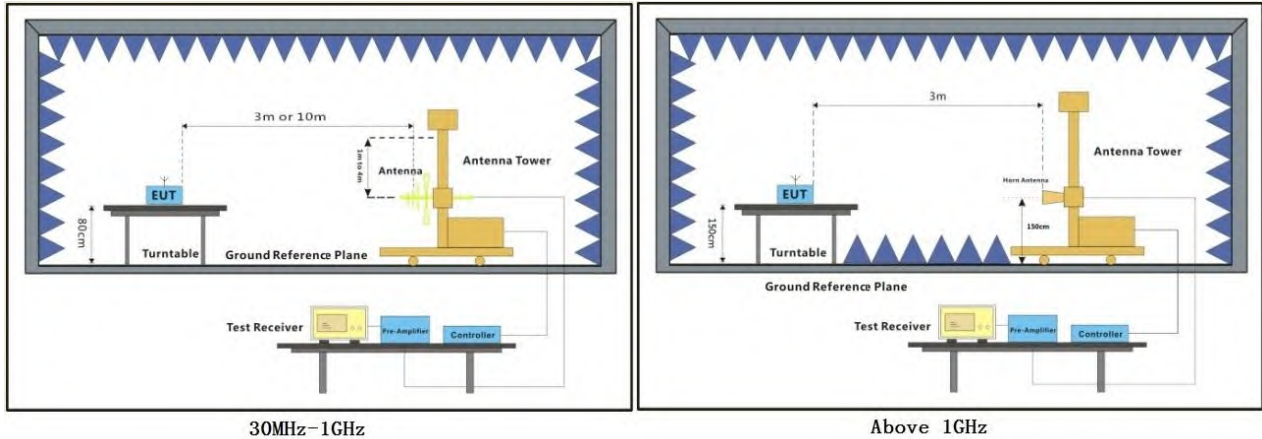
Operating Environment:
 Temperature: 24.5 °C Humidity: 50.8 % RH Atmospheric Pressure: 1020 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.



7.2.3 Test Setup Diagram



30MHz-1GHz

Above 1GHz



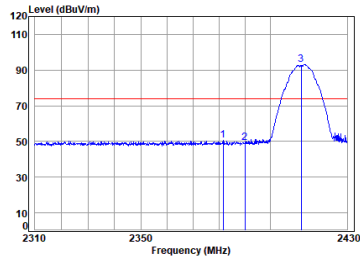
7.2.4 Measurement Procedure and Data

- 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.

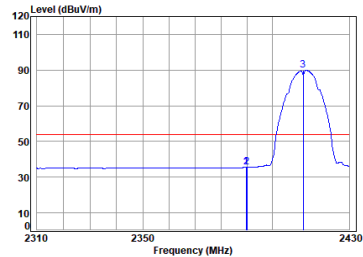
11b_TX_CH_01_Horizontal-Peak



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2381.631	6.82	27.43	30.69	47.00	50.56	74.00	-23.44	Peak
2	2390.000	6.83	27.46	30.69	45.58	49.18	74.00	-24.82	Peak
3 pp	2412.000	6.91	27.52	30.69	89.38	93.12	74.00	19.12	Peak

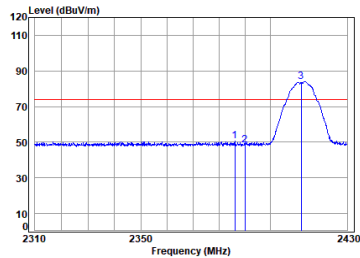
11b_TX_CH_01_Horizontal-Avg



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.726	6.82	27.46	30.69	31.82	35.41	54.00	-18.59	Average
2	2390.000	6.83	27.46	30.69	31.81	35.41	54.00	-18.59	Average
3 pp	2412.000	6.91	27.52	30.69	86.16	89.90	54.00	35.90	Average

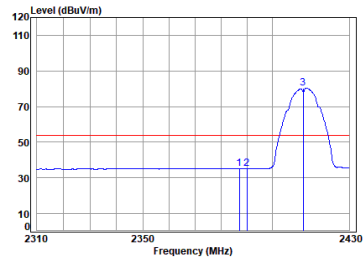
11b_TX_CH_01_Vertical-Peak



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2386.098	6.82	27.44	30.69	46.99	50.56	74.00	-23.44	Peak
2	2390.000	6.83	27.46	30.69	44.70	48.30	74.00	-25.70	Peak
3 pp	2412.000	6.91	27.52	30.69	80.43	84.17	74.00	10.17	Peak

11b_TX_CH_01_Vertical-Avg

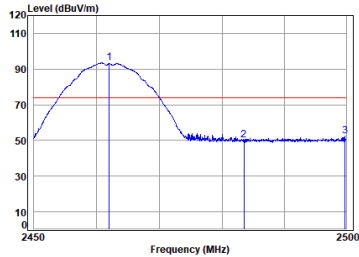


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2387.065	6.82	27.45	30.69	31.51	35.09	54.00	-18.91	Average
2	2390.000	6.83	27.46	30.69	31.45	35.05	54.00	-18.95	Average
3 pp	2412.000	6.91	27.52	30.69	76.64	80.38	54.00	26.38	Average



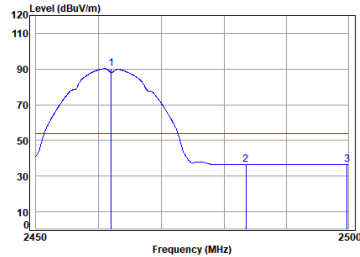
11b_TX_CH_11_Horizontal-Peak



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.000	7.25	27.67	30.70	89.10	93.32	74.00	19.32	Peak
2	2483.500	7.40	27.80	30.71	45.54	50.03	74.00	-23.97	Peak
3	2499.798	7.51	27.90	30.71	47.69	52.39	74.00	-21.61	Peak

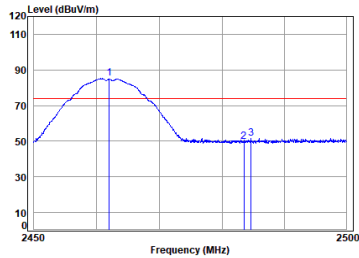
11b_TX_CH_11_Horizontal-Avg



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.000	7.25	27.67	30.70	85.96	90.18	54.00	36.18	Average
2	2483.500	7.40	27.80	30.71	31.96	36.45	54.00	-17.55	Average
3	2499.848	7.51	27.90	30.71	31.94	36.64	54.00	-17.36	Average

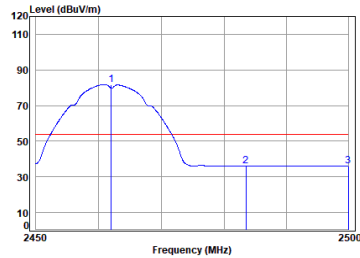
11b_TX_CH_11_Vertical-Peak



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.000	7.25	27.67	30.70	80.88	85.10	74.00	11.10	Peak
2	2483.500	7.40	27.80	30.71	45.32	49.81	74.00	-24.19	Peak
3	2484.693	7.41	27.81	30.71	46.85	51.36	74.00	-22.64	Peak

11b_TX_CH_11_Vertical-Avg

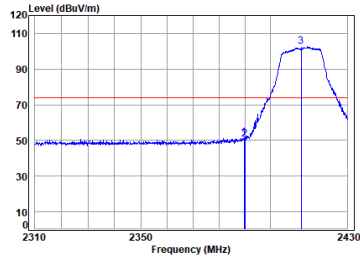


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2462.000	7.25	27.67	30.70	77.63	81.85	54.00	27.85	Average
2	2483.500	7.40	27.80	30.71	31.54	36.03	54.00	-17.97	Average
3	2500.000	7.51	27.90	30.71	31.57	36.27	54.00	-17.73	Average



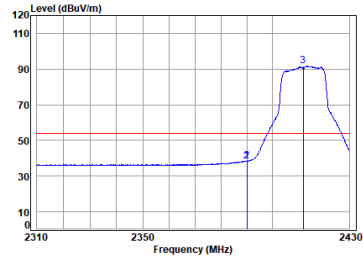
11g_TX_CH_01_Horizontal-Peak



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.726	6.82	27.46	30.69	48.11	51.70	74.00	-22.30	Peak
2	2390.000	6.83	27.46	30.69	47.02	50.62	74.00	-23.38	Peak
3 pp	2412.000	6.91	27.52	30.69	98.79	102.53	74.00	28.53	Peak

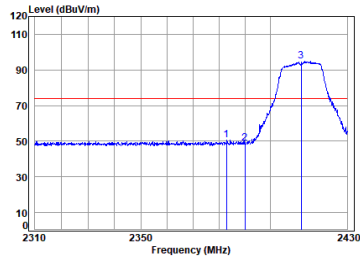
11g_TX_CH_01_Horizontal-Avg



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.968	6.83	27.46	30.69	34.88	38.48	54.00	-15.52	Average
2	2390.000	6.83	27.46	30.69	34.88	38.48	54.00	-15.52	Average
3 pp	2412.000	6.91	27.52	30.69	88.06	91.80	54.00	37.80	Average

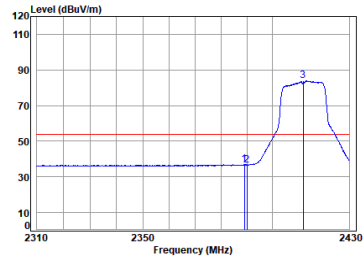
11g_TX_CH_01_Vertical-Peak



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2382.958	6.82	27.43	30.69	47.09	50.65	74.00	-23.35	Peak
2	2390.000	6.83	27.46	30.69	45.22	48.82	74.00	-25.18	Peak
3 pp	2412.000	6.91	27.52	30.69	91.05	94.79	74.00	20.79	Peak

11g_TX_CH_01_Vertical-Avg

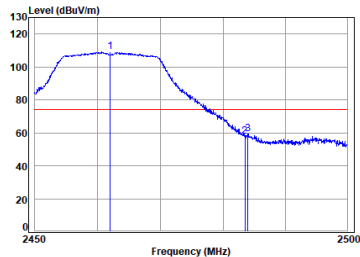


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2412 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.000	6.82	27.46	30.69	33.30	36.89	54.00	-17.11	Average
2	2390.000	6.83	27.46	30.69	33.07	36.67	54.00	-17.33	Average
3 pp	2412.000	6.91	27.52	30.69	80.03	83.77	54.00	29.77	Average



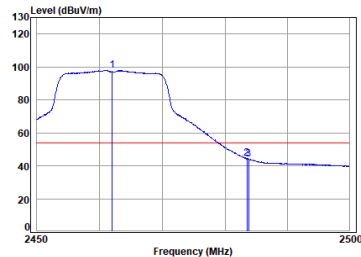
11g_TX_CH_11_Horizontal-Peak



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	104.80	109.02	74.00	35.02	Peak
2	2483.500	7.40	27.80	30.71	53.38	57.87	74.00	-16.13	Peak
3	2483.990	7.40	27.80	30.71	55.04	59.53	74.00	-14.47	Peak

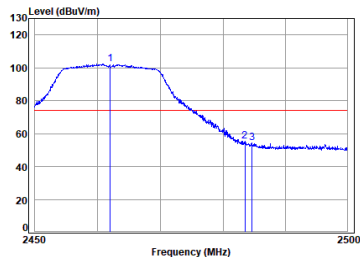
11g_TX_CH_11_Horizontal-Avg



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	93.70	97.92	54.00	43.92	Average
2	2483.500	7.40	27.80	30.71	40.19	44.68	54.00	-9.32	Average
3	2483.790	7.40	27.80	30.71	39.62	44.11	54.00	-9.89	Average

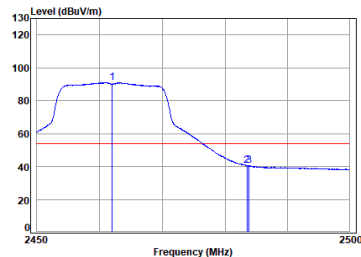
11g_TX_CH_11_Vertical-Peak



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	97.94	102.16	74.00	28.16	Peak
2	2483.500	7.40	27.80	30.71	50.90	55.39	74.00	-18.61	Peak
3	2484.643	7.41	27.81	30.71	49.88	54.39	74.00	-19.61	Peak

11g_TX_CH_11_Vertical-Avg



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2462 Band edge
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	86.94	91.15	54.00	37.16	Average
2	2483.500	7.40	27.80	30.71	36.15	40.64	54.00	-13.36	Average
3	2483.840	7.40	27.80	30.71	36.09	40.58	54.00	-13.42	Average



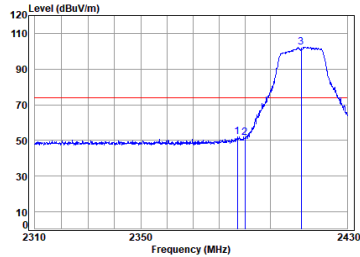
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中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

11n_HT(20M)_TX_CH_01_Horizontal-Peak



Condition: 3m HORIZONTAL

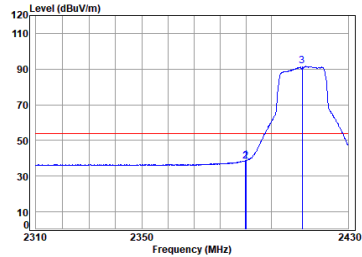
Job No : 05167MM

Mode : 2412 Band edge

: 2.4G Wi-Fi 11n20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2387.186	6.82	27.45	30.69	48.52	52.10	74.00	-21.90	Peak
2	2390.000	6.83	27.46	30.69	48.12	51.72	74.00	-22.28	Peak
3 pp	2412.000	6.91	27.52	30.69	98.67	102.41	74.00	28.41	Peak

11n_HT(20M)_TX_CH_01_Horizontal-Avg



Condition: 3m HORIZONTAL

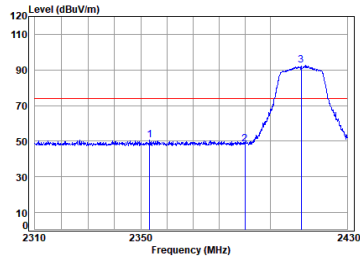
Job No : 05167MM

Mode : 2412 Band edge

: 2.4G Wi-Fi 11n20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.847	6.83	27.46	30.69	35.06	38.66	54.00	-15.34	Average
2	2390.000	6.83	27.46	30.69	34.94	38.54	54.00	-15.46	Average
3 pp	2412.000	6.91	27.52	30.69	87.85	91.59	54.00	37.59	Average

11n_HT(20M)_TX_CH_01_Vertical-Peak



Condition: 3m VERTICAL

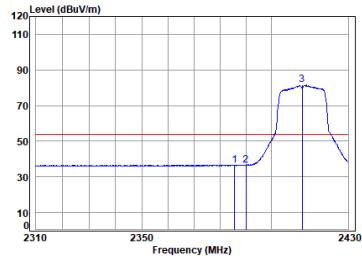
Job No : 05167MM

Mode : 2412 Band edge

: 2.4G Wi-Fi 11n20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2353.455	6.81	27.31	30.68	47.05	50.49	74.00	-23.51	Peak
2	2390.000	6.83	27.46	30.69	44.90	48.50	74.00	-25.50	Peak
3 pp	2412.000	6.91	27.52	30.69	88.67	92.41	74.00	18.41	Peak

11n_HT(20M)_TX_CH_01_Vertical-Avg



Condition: 3m VERTICAL

Job No : 05167MM

Mode : 2412 Band edge

: 2.4G Wi-Fi 11n20

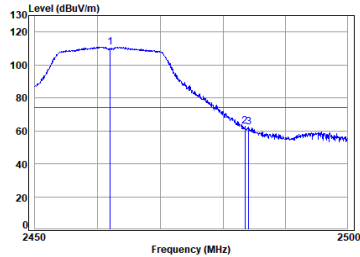
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2385.615	6.82	27.44	30.69	33.05	36.62	54.00	-17.38	Average
2	2390.000	6.83	27.46	30.69	32.98	36.58	54.00	-17.42	Average
3 pp	2412.000	6.91	27.52	30.69	77.76	81.50	54.00	27.50	Average



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11n_HT(20M)_TX_CH_11_Horizontal-Peak



Condition: 3m HORIZONTAL

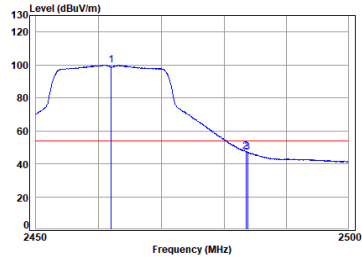
Job No : 05167MM

Mode : 2462 Band edge

: 2.4G Wi-Fi 11n20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	106.75	110.97	74.00	36.97	Peak
2	2483.500	7.40	27.80	30.71	58.48	62.97	74.00	-11.03	Peak
3	2484.141	7.40	27.80	30.71	57.90	62.39	74.00	-11.61	Peak

11n_HT(20M)_TX_CH_11_Horizontal-Avg



Condition: 3m HORIZONTAL

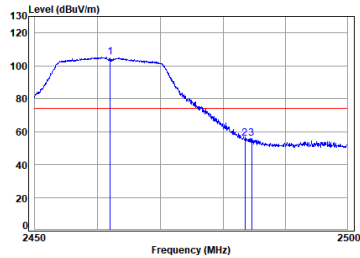
Job No : 05167MM

Mode : 2462 Band edge

: 2.4G Wi-Fi 11n20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	95.75	99.97	54.00	45.97	Average
2	2483.500	7.40	27.80	30.71	43.06	47.55	54.00	-6.45	Average
3	2483.790	7.40	27.80	30.71	42.59	47.08	54.00	-6.92	Average

11n_HT(20M)_TX_CH_11_Vertical-Peak



Condition: 3m VERTICAL

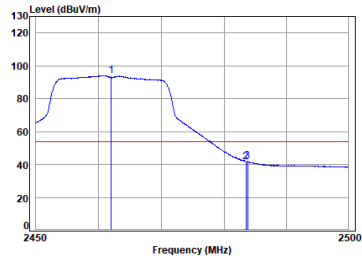
Job No : 05167MM

Mode : 2462 Band edge

: 2.4G Wi-Fi 11n20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	101.03	105.25	74.00	31.25	Peak
2	2483.500	7.40	27.80	30.71	51.17	55.66	74.00	-18.34	Peak
3	2484.593	7.41	27.81	30.71	51.52	56.03	74.00	-17.97	Peak

11n_HT(20M)_TX_CH_11_Vertical-Avg



Condition: 3m VERTICAL

Job No : 05167MM

Mode : 2462 Band edge

: 2.4G Wi-Fi 11n20

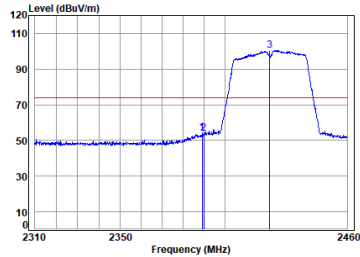
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2462.000	7.25	27.67	30.70	89.82	94.04	54.00	40.04	Average
2	2483.500	7.40	27.80	30.71	37.26	41.75	54.00	-12.25	Average
3	2483.790	7.40	27.80	30.71	37.36	41.85	54.00	-12.15	Average



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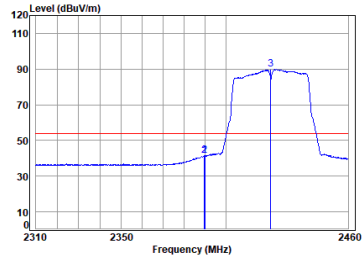
11n_HT(40M)_TX_CH_03_Horizontal-Peak



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2422 Band edge
: 2.4G Wi-Fi 11n40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.075	6.82	27.46	30.69	50.50	54.09	74.00	-19.91	Peak
2	2390.000	6.83	27.46	30.69	50.03	53.63	74.00	-20.37	Peak
3 pp	2422.000	6.98	27.54	30.69	95.63	100.46	74.00	26.46	Peak

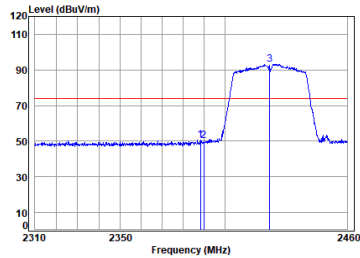
11n_HT(40M)_TX_CH_03_Horizontal-Avg



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2422 Band edge
: 2.4G Wi-Fi 11n40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.827	6.83	27.46	30.69	37.91	41.51	54.00	-12.49	Average
2	2390.000	6.83	27.46	30.69	37.77	41.37	54.00	-12.63	Average
3 pp	2422.000	6.98	27.54	30.69	86.06	89.89	54.00	35.89	Average

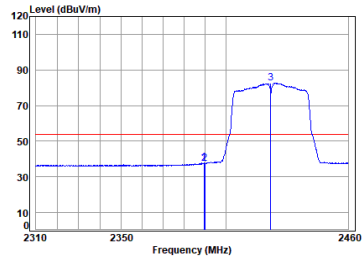
11n_HT(40M)_TX_CH_03_Vertical-Peak



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2422 Band edge
: 2.4G Wi-Fi 11n40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.324	6.82	27.45	30.69	47.11	50.69	74.00	-23.31	Peak
2	2390.000	6.83	27.46	30.69	46.57	50.17	74.00	-23.83	Peak
3 pp	2422.000	6.98	27.54	30.69	89.40	93.23	74.00	19.23	Peak

11n_HT(40M)_TX_CH_03_Vertical-Avg

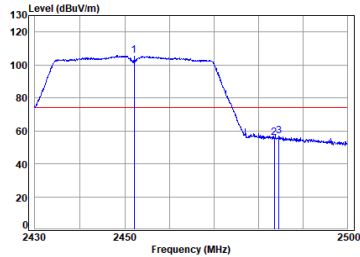


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2422 Band edge
: 2.4G Wi-Fi 11n40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.526	6.82	27.46	30.69	34.31	37.90	54.00	-16.10	Average
2	2390.000	6.83	27.46	30.69	34.03	37.63	54.00	-16.37	Average
3 pp	2422.000	6.98	27.54	30.69	78.84	82.67	54.00	28.67	Average



11n_HT(40M)_TX_CH_09_Horizontal-Peak



Condition: 3m HORIZONTAL

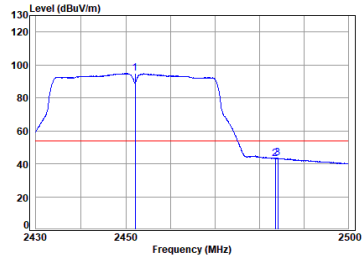
Job No : 05167MM

Mode : 2452 Band edge

: 2.4G Wi-Fi 11n40

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 2452.000	7.19	27.61	30.70	101.69	105.79	74.00	31.79	Peak
2 2483.500	7.40	27.80	30.71	51.41	55.90	74.00	-18.10	Peak
3 2484.570	7.41	27.81	30.71	52.53	57.04	74.00	-16.96	Peak

11n_HT(40M)_TX_CH_09_Horizontal-Avg



Condition: 3m HORIZONTAL

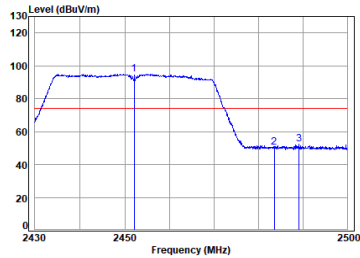
Job No : 05167MM

Mode : 2452 Band edge

: 2.4G Wi-Fi 11n40

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 2452.000	7.19	27.61	30.70	90.66	94.76	54.00	40.76	Average
2 2483.500	7.40	27.80	30.71	38.75	43.24	54.00	-10.76	Average
3 2484.076	7.40	27.80	30.71	38.84	43.33	54.00	-10.67	Average

11n_HT(40M)_TX_CH_09_Vertical-Peak



Condition: 3m VERTICAL

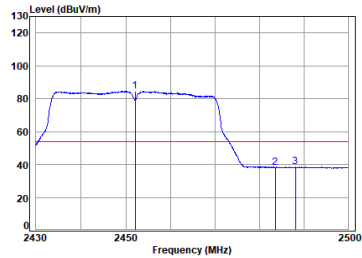
Job No : 05167MM

Mode : 2452 Band edge

: 2.4G Wi-Fi 11n40

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 2452.000	7.19	27.61	30.70	90.94	95.04	74.00	21.04	Peak
2 2483.500	7.40	27.80	30.71	45.96	50.45	74.00	-23.55	Peak
3 2489.090	7.44	27.83	30.71	47.97	52.53	74.00	-21.47	Peak

11n_HT(40M)_TX_CH_09_Vertical-Avg



Condition: 3m VERTICAL

Job No : 05167MM

Mode : 2452 Band edge

: 2.4G Wi-Fi 11n40

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 2452.000	7.19	27.61	30.70	80.36	84.46	54.00	30.46	Average
2 2483.500	7.40	27.80	30.71	33.66	38.15	54.00	-15.85	Average
3 2488.030	7.43	27.83	30.71	33.86	38.41	54.00	-15.59	Average



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7.3 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
 Test Method: ANSI C63.10 (2020) Section 6.4,6.5
 Measurement Distance: 3m
 Test Engineer: Mason Wu

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

7.3.1 E.U.T. Operation

Operating Environment:

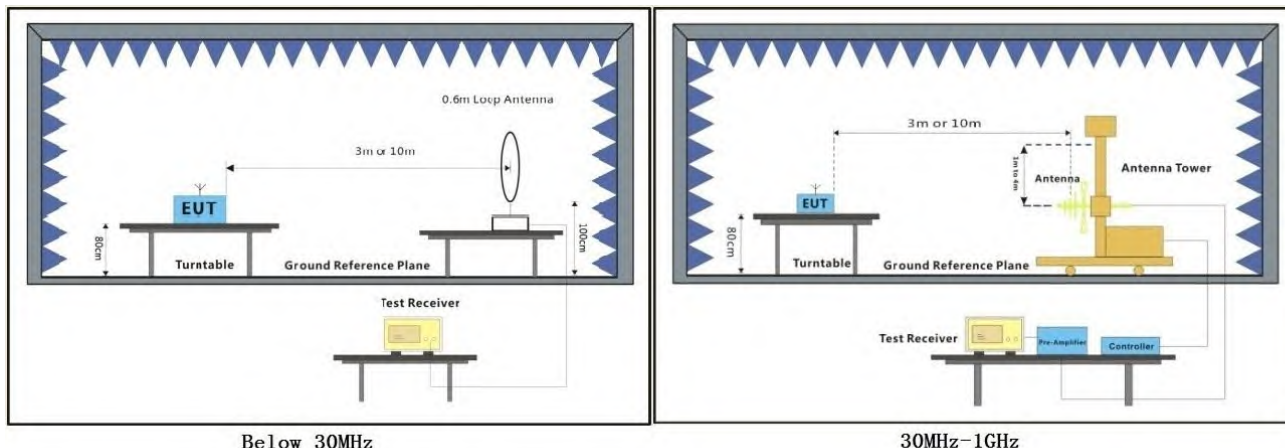
Temperature: 23.4 °C Humidity: 47.5 % RH Atmospheric Pressure: 1020 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.



7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 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.
- Repeat above procedures until all frequencies measured was complete.

Remark:

- Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 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.

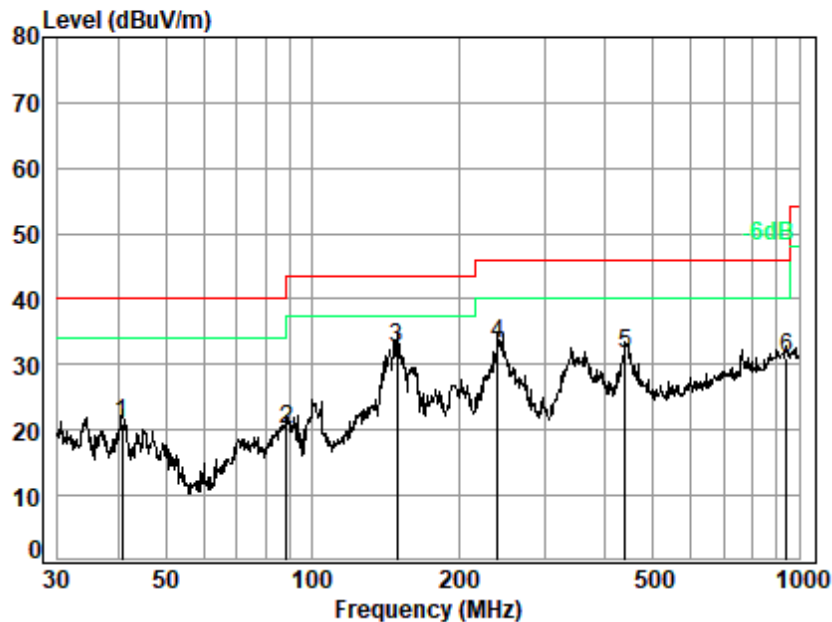
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SZEMC-TRF-01 Rev. A/2

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Test Mode: 03; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 05167WM
Test Mode: 03

	Ant Freq	Cable Factor	Preamp Loss	Read Factor	Level	Limit	Over	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	40.702	16.05	0.83	27.64	31.86	21.10	40.00	-18.90 QP
2	88.652	11.57	1.17	27.61	35.09	20.22	43.50	-23.28 QP
3 q	149.486	12.98	1.50	27.72	45.86	32.62	43.50	-10.88 QP
4	240.830	17.08	1.89	27.66	41.74	33.05	46.00	-12.95 QP
5	440.196	21.08	2.63	27.83	35.67	31.55	46.00	-14.45 QP
6	942.131	28.19	4.06	26.72	25.35	30.88	46.00	-15.12 QP



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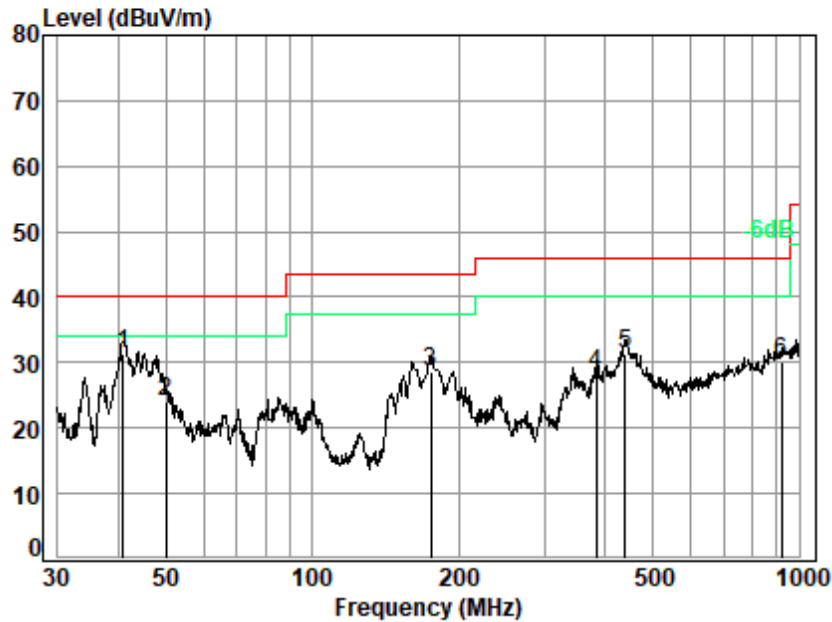
SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/2

Report No.: SZCR251100516705

Page: 30 of 91

Test Mode: 03; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 05167WM
Test Mode: 03

		Ant	Cable	Preamp	Read		Limit	Over	
	Freq	Factor	Loss	Factor	Level	Level	Line	Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	q	40.845	15.98	0.83	27.64	42.13	31.30	40.00	-8.70 QP
2		50.057	12.75	0.90	27.63	37.87	23.89	40.00	-16.11 QP
3		175.037	13.78	1.61	27.76	41.02	28.65	43.50	-14.85 QP
4		382.588	20.90	2.43	27.71	32.81	28.43	46.00	-17.57 QP
5		440.196	21.08	2.63	27.83	35.53	31.41	46.00	-14.59 QP
6		919.287	28.17	4.02	26.85	24.78	30.12	46.00	-15.88 QP



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7.4 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
 Test Method: ANSI C63.10 (2020) Section 6.6
 Measurement Distance: 3m
 Test Engineer: Xing Guo

Limit:

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

7.4.1 E.U.T. Operation

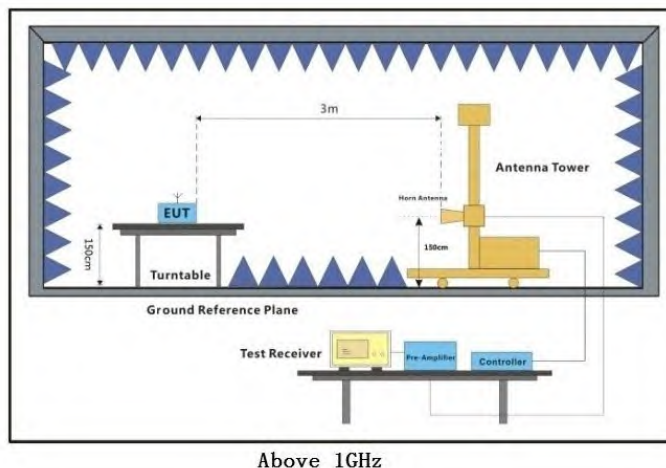
Operating Environment:

Temperature: 24.5 °C Humidity: 50.8 % RH Atmospheric Pressure: 1020 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

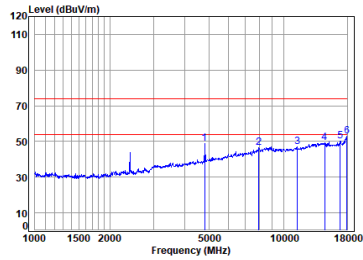
- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was 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.



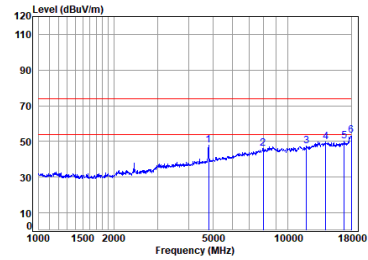
11b_TX_CH_01_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2412 TX RSE
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4818.016	8.92	31.97	55.42	63.14	48.61	74.00	-25.39	Peak
2	7943.838	11.48	37.69	56.52	53.83	46.48	74.00	-27.52	Peak
3	11335.190	14.29	39.70	55.39	48.27	46.87	74.00	-27.13	Peak
4	14618.170	16.62	39.28	54.25	47.53	49.18	74.00	-24.82	Peak
5	16891.040	19.64	39.60	54.09	45.17	50.32	74.00	-23.68	Peak
6	pp17948.050	18.75	43.44	54.20	44.90	52.89	74.00	-21.11	Peak

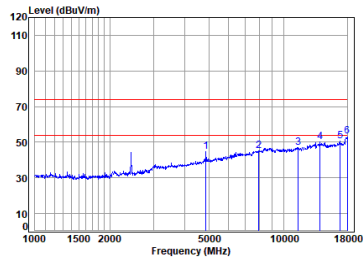
11b_TX_CH_01_Vertical



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2412 TX RSE
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4884.110	8.90	31.92	55.41	62.28	47.69	74.00	-26.31	Peak
2	7989.893	11.46	37.78	56.50	53.55	46.29	74.00	-27.71	Peak
3	11906.070	14.62	39.71	55.23	48.52	47.62	74.00	-26.38	Peak
4	14242.800	16.83	39.80	54.40	47.39	49.62	74.00	-24.38	Peak
5	16891.040	19.64	39.60	54.09	44.85	50.00	74.00	-24.00	Peak
6	pp18000.000	18.64	43.80	54.20	45.12	53.36	74.00	-20.64	Peak

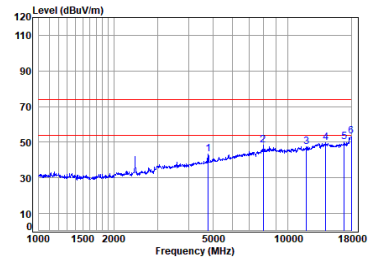
11b_TX_CH_06_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2437 TX RSE
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4874.043	8.97	32.15	55.44	58.96	44.64	74.00	-29.36	Peak
2	7943.838	11.48	37.69	56.52	52.60	45.25	74.00	-28.75	Peak
3	11433.910	14.14	39.67	55.36	48.59	47.04	74.00	-26.96	Peak
4	13997.930	16.53	39.90	54.50	48.24	50.17	74.00	-23.83	Peak
5	16891.040	19.64	39.60	54.09	45.63	50.78	74.00	-23.22	Peak
6	pp18000.000	18.64	43.80	54.20	45.23	53.47	74.00	-20.53	Peak

11b_TX_CH_06_Vertical

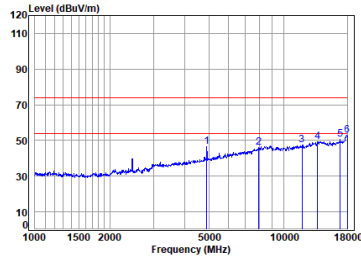


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2437 TX RSE
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4790.245	8.89	31.88	55.40	57.85	43.22	74.00	-30.78	Peak
2	7989.893	11.46	37.78	56.50	55.70	48.44	74.00	-25.56	Peak
3	11906.070	14.62	39.71	55.23	48.54	47.64	74.00	-26.36	Peak
4	14242.800	16.83	39.80	54.40	47.56	49.79	74.00	-24.21	Peak
5	16891.040	19.64	39.60	54.09	45.23	50.38	74.00	-23.62	Peak
6	pp18000.000	18.64	43.80	54.20	44.98	53.22	74.00	-20.78	Peak



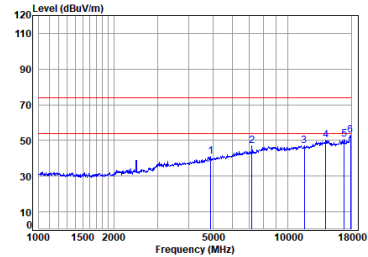
11b_TX_CH_11_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2462 TX RSE
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4916.490	9.02	32.20	55.46	60.59	46.35	74.00	-27.65	Peak	
2	7943.838	11.48	37.69	56.52	53.38	46.03	74.00	-27.97	Peak	
3	11837.450	14.61	39.64	55.24	48.45	47.46	74.00	-26.54	Peak	
4	13677.970	16.04	40.00	54.61	47.93	49.36	74.00	-24.64	Peak	
5	16891.040	19.64	39.60	54.09	45.36	50.51	74.00	-23.49	Peak	
6	pp18000.000	18.64	43.80	54.20	44.70	52.94	74.00	-21.06	Peak	

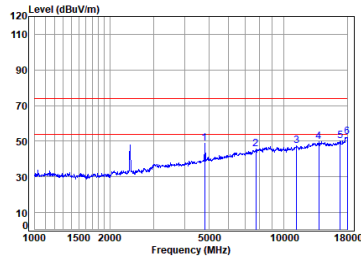
11b_TX_CH_11_Vertical



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2462 TX RSE
: 2.4G Wi-Fi 11b

	Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4902.300	9.00	32.20	55.46	55.44	41.18	74.00	-32.82	Peak	
2	7179.527	11.13	36.56	56.74	56.16	47.11	74.00	-26.89	Peak	
3	11667.690	14.42	39.53	55.29	48.40	47.06	74.00	-26.94	Peak	
4	14242.800	16.83	39.80	54.40	48.16	50.39	74.00	-23.61	Peak	
5	16891.040	19.64	39.60	54.09	45.39	50.54	74.00	-23.46	Peak	
6	pp17896.250	18.87	43.08	54.19	45.18	52.94	74.00	-21.06	Peak	

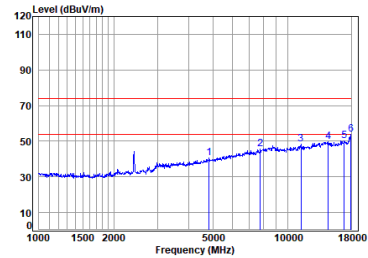
11g_TX_CH_01_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2412 TX RSE
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4818.016	8.92	31.97	55.42	63.32	48.79	74.00	-25.21	Peak	
2	7739.857	11.22	36.98	56.57	53.99	45.62	74.00	-28.38	Peak	
3	11269.860	14.35	39.67	55.41	48.74	47.35	74.00	-26.65	Peak	
4	13837.020	15.67	39.90	54.55	48.54	49.56	74.00	-24.44	Peak	
5	16891.040	19.64	39.60	54.09	44.84	49.99	74.00	-24.01	Peak	
6	pp18000.000	18.64	43.80	54.20	44.03	52.27	74.00	-21.73	Peak	

11g_TX_CH_01_Vertical

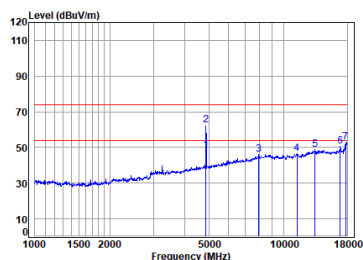


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2412 TX RSE
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	4831.962	8.93	32.03	55.42	55.22	40.76	74.00	-33.24	Peak	
2	7762.260	11.22	37.05	56.57	54.13	45.83	74.00	-28.17	Peak	
3	11302.480	14.39	39.70	55.40	49.82	48.51	74.00	-25.49	Peak	
4	14575.970	16.46	39.35	54.27	48.03	49.57	74.00	-24.43	Peak	
5	16891.040	19.64	39.60	54.09	45.27	50.42	74.00	-23.58	Peak	
6	pp17948.050	18.75	43.44	54.20	45.71	53.70	74.00	-20.30	Peak	



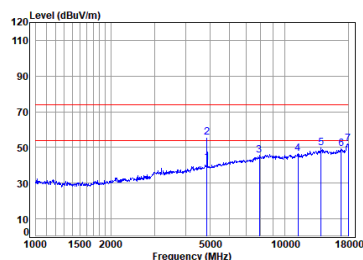
11g_TX_CH_06_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2437 TX RSE
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	pp 4874.000	8.97	32.15	55.44	62.89	48.57	54.00	-5.43	Average	
2	pk 4874.000	8.97	32.15	55.44	76.74	62.42	74.00	-11.58	Peak	
3	7943.838	11.48	37.69	56.52	53.36	46.01	74.00	-27.99	Peak	
4	11302.480	14.39	39.70	55.40	47.87	46.56	74.00	-27.44	Peak	
5	13365.320	15.79	40.30	54.71	47.62	49.00	74.00	-25.00	Peak	
6	16891.040	19.64	39.60	54.09	45.44	50.59	74.00	-23.41	Peak	
7	17741.740	19.02	42.09	54.18	45.82	52.75	74.00	-21.25	Peak	

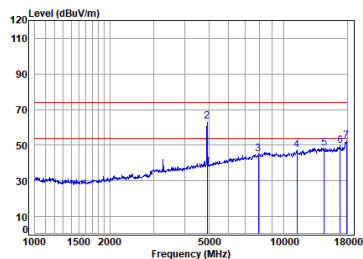
11g_TX_CH_06_Vertical



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2437 TX RSE
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	pp 4874.000	8.97	32.15	55.44	56.00	41.68	54.00	-12.32	Average	
2	pk 4874.000	8.97	32.15	55.44	69.81	55.49	74.00	-18.51	Peak	
3	7920.911	11.48	37.64	56.52	52.92	45.52	74.00	-28.48	Peak	
4	11302.480	14.39	39.70	55.40	48.07	46.76	74.00	-27.24	Peak	
5	13997.930	16.53	39.90	54.50	48.00	49.93	74.00	-24.07	Peak	
6	16891.040	19.64	39.60	54.09	44.00	49.15	74.00	-24.85	Peak	
7	18000.000	18.64	43.80	54.20	43.64	51.88	74.00	-22.12	Peak	

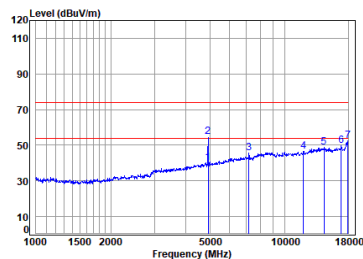
11g_TX_CH_11_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2462 TX RSE
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	pp 4924.000	9.03	32.20	55.47	63.10	48.86	54.00	-5.14	Average	
2	pk 4924.000	9.03	32.20	55.47	77.67	63.43	74.00	-10.57	Peak	
3	7920.911	11.48	37.64	56.52	52.43	45.03	74.00	-28.97	Peak	
4	11302.480	14.39	39.70	55.40	48.60	47.29	74.00	-26.71	Peak	
5	14533.910	16.36	39.43	54.28	47.02	48.53	74.00	-25.47	Peak	
6	16891.040	19.64	39.60	54.09	44.46	49.61	74.00	-24.39	Peak	
7	17896.250	18.87	43.08	54.19	44.61	52.37	74.00	-21.63	Peak	

11g_TX_CH_11_Vertical

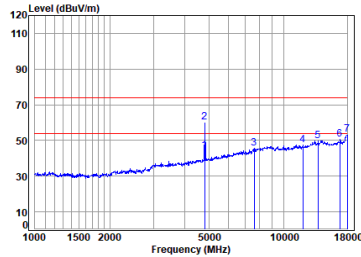


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2462 TX RSE
: 2.4G Wi-Fi 11g

	Freq	Cable Loss	Factor	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	pp 4924.000	9.03	32.20	55.47	54.53	40.29	54.00	-13.71	Average	
2	pk 4924.000	9.03	32.20	55.47	69.22	54.98	74.00	-19.02	Peak	
3	7179.527	11.13	36.56	56.74	54.63	45.58	74.00	-28.42	Peak	
4	11906.070	14.62	39.71	55.23	47.34	46.44	74.00	-27.56	Peak	
5	14408.430	16.90	39.59	54.33	46.63	48.79	74.00	-25.21	Peak	
6	16891.040	19.64	39.60	54.09	44.76	49.91	74.00	-24.09	Peak	
7	17948.050	18.75	43.44	54.20	44.49	52.48	74.00	-21.52	Peak	



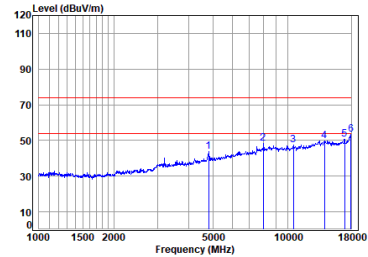
11n_20M_TX_CH_01_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2412 TX RSE
: 2.4G Wi-Fi 11n20

Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp 4818.016	8.92	31.97	55.42	59.00	44.47	54.00	-9.53	Average	
2 pk 4818.016	8.92	31.97	55.42	74.53	60.00	74.00	-14.00	Peak	
3 7606.788	11.03	36.61	56.61	54.29	45.52	74.00	-28.48	Peak	
4 11940.540	14.52	39.74	55.22	48.48	47.52	74.00	-26.48	Peak	
5 13757.270	15.82	39.94	54.58	48.70	49.88	74.00	-24.12	Peak	
6 16842.290	18.46	39.60	54.09	46.60	50.57	74.00	-23.43	Peak	
7 18000.000	18.64	43.80	54.20	45.20	53.44	74.00	-20.56	Peak	

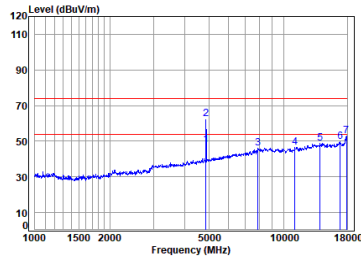
11n_20M_TX_CH_01_Vertical



Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2412 TX RSE
: 2.4G Wi-Fi 11n20

Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 4818.016	8.92	31.97	55.42	58.21	43.68	74.00	-30.32	Peak	
2 7989.893	11.46	37.78	56.50	55.83	48.57	74.00	-25.43	Peak	
3 10545.010	13.33	39.19	55.63	50.60	47.49	74.00	-26.51	Peak	
4 14038.450	16.47	39.90	54.48	47.99	49.88	74.00	-24.12	Peak	
5 16939.940	19.22	39.64	54.10	46.08	50.84	74.00	-23.16	Peak	
6 pp17948.050	18.75	43.44	54.20	45.27	53.26	74.00	-20.74	Peak	

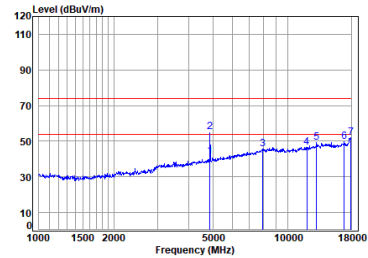
11n_20M_TX_CH_06_Horizontal



Condition: 3m HORIZONTAL
Job No : 05167MM
Mode : 2437 TX RSE
: 2.4G Wi-Fi 11n20

Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp 4874.000	8.97	32.15	55.44	62.28	47.96	54.00	-6.04	Average	
2 pk 4874.000	8.97	32.15	55.44	76.98	62.66	74.00	-11.34	Peak	
3 7875.254	11.42	37.50	56.54	53.75	46.13	74.00	-27.87	Peak	
4 11076.100	14.14	39.48	55.46	48.54	46.70	74.00	-27.30	Peak	
5 13997.930	16.53	39.90	54.50	46.94	48.87	74.00	-25.13	Peak	
6 16891.040	19.64	39.60	54.09	44.72	49.87	74.00	-24.13	Peak	
7 17896.250	18.87	43.08	54.19	44.95	52.71	74.00	-21.29	Peak	

11n_20M_TX_CH_06_Vertical

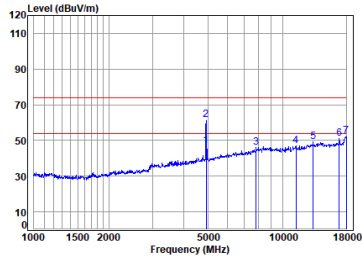


Condition: 3m VERTICAL
Job No : 05167MM
Mode : 2437 TX RSE
: 2.4G Wi-Fi 11n20

Freq	Cable Loss	Factor	Ant Factor	Preamp	Read Level	Level	Limit	Over	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp 4874.000	8.97	32.15	55.44	55.68	41.36	54.00	-12.64	Average	
2 pk 4874.000	8.97	32.15	55.44	69.38	55.06	74.00	-18.94	Peak	
3 7943.838	11.48	37.69	56.52	52.80	45.45	74.00	-28.55	Peak	
4 11940.540	14.52	39.74	55.22	47.62	46.66	74.00	-27.34	Peak	
5 13059.820	15.49	40.30	54.82	48.09	49.06	74.00	-24.94	Peak	
6 16891.040	19.64	39.60	54.09	44.62	49.77	74.00	-24.23	Peak	
7 17948.050	18.75	43.44	54.20	44.14	52.13	74.00	-21.87	Peak	



11n_20M_TX_CH_11_Horizontal



Condition: 3m HORIZONTAL

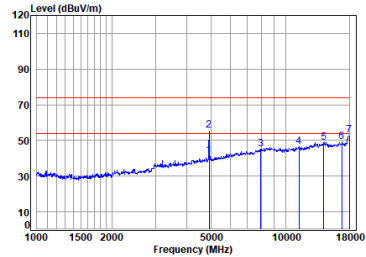
Job No : 05167MM

Mode : 2462 TX RSE

: 2.4G Wi-Fi 11n20

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Line	Limit	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 4924.000	9.03	32.20	55.47	61.07	46.83	54.00	-7.17	Average
2 pk 4924.000	9.03	32.20	55.47	76.05	61.81	74.00	-12.19	Peak
3 7807.262	11.23	37.23	56.55	54.21	46.12	74.00	-27.88	Peak
4 11302.480	14.39	39.70	55.40	48.51	47.20	74.00	-26.80	Peak
5 13249.930	15.91	40.25	54.75	47.87	49.28	74.00	-24.72	Peak
6 16891.040	19.64	39.60	54.09	46.07	51.22	74.00	-22.78	Peak
7 18000.000	18.64	43.80	54.20	44.13	52.37	74.00	-21.63	Peak

11n_20M_TX_CH_11_Vertical



Condition: 3m VERTICAL

Job No : 05167MM

Mode : 2462 TX RSE

: 2.4G Wi-Fi 11n20

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Line	Limit	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 4924.000	9.03	32.20	55.47	55.71	41.47	54.00	-12.53	Average
2 pk 4924.000	9.03	32.20	55.47	69.79	55.55	74.00	-18.45	Peak
3 7943.838	11.48	37.69	56.52	52.50	45.15	74.00	-28.85	Peak
4 11302.480	14.39	39.70	55.40	47.83	46.52	74.00	-27.48	Peak
5 14242.800	16.83	39.80	54.40	46.72	48.95	74.00	-25.05	Peak
6 16842.290	18.46	39.60	54.09	45.49	49.46	74.00	-24.54	Peak
7 18000.000	18.64	43.80	54.20	44.66	52.90	74.00	-21.10	Peak



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7.5 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2020) Section 11.9.2

Test Engineer: Linvo Ding

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥ 50 hopping channels
	0.25 for $25 \leq$ 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

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 21.6 °C

Humidity: 64.3 % RH

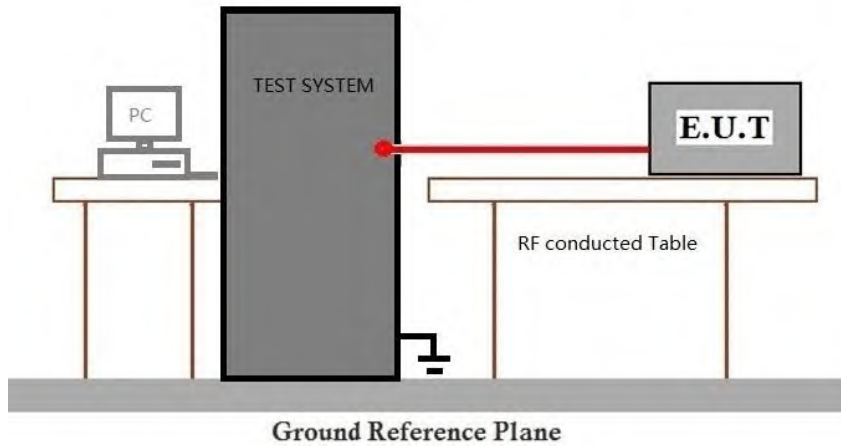
Atmospheric Pressure: 1020 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.



7.5.3 Test Setup Diagram



7.5.4 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



7.6 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
 Test Method: ANSI C63.10 (2020) Section 11.8.1
 Test Engineer: Linvo Ding

Limit:
 ≥500 kHz

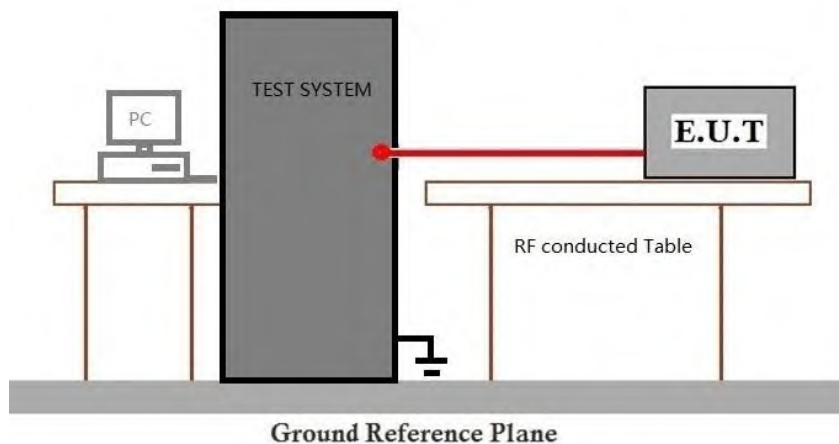
7.6.1 E.U.T. Operation

Operating Environment:
 Temperature: 21.6 °C Humidity: 64.3 % RH Atmospheric Pressure: 1020 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.7 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)

Test Method: ANSI C63.10 (2020) Section 11.10.2

Test Engineer: Linvo Ding

Limit:

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

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 21.6 °C

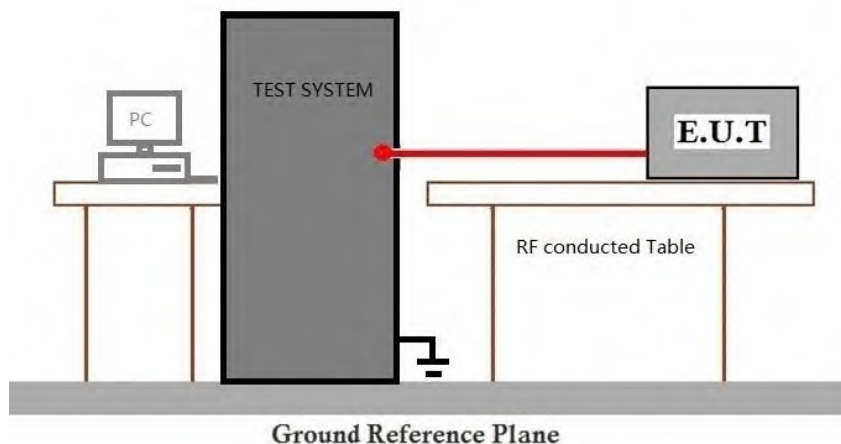
Humidity: 64.3 % RH

Atmospheric Pressure: 1020 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

Please Refer to Appendix for Details



7.8 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2020) Section 6.10.4

Test Engineer: Linvo Ding

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)).

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 21.6 °C

Humidity: 64.3 % RH

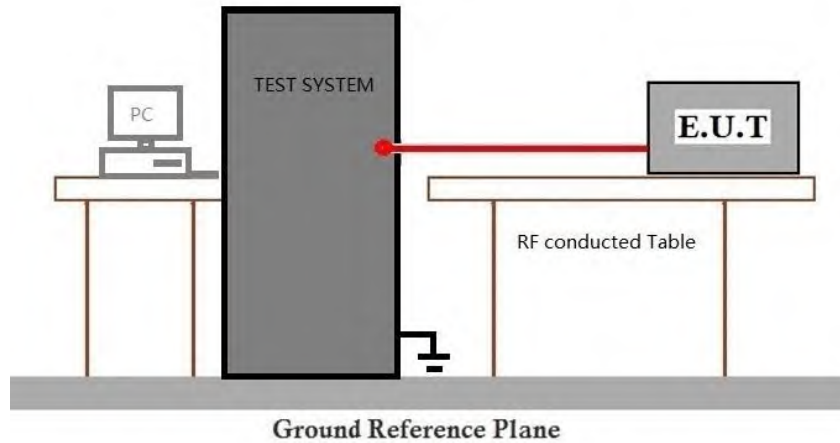
Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.



7.8.3 Test Setup Diagram



7.8.4 Measurement Procedure and Data

Please Refer to Appendix for Details



7.9 Conducted Spurious Emissions

Test Requirement: 47 CFR Part 15, Subpart C 15.247(d)
 Test Method: ANSI C63.10 (2020) Section 11.11
 Test Engineer: Linvo Ding

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)).

7.9.1 E.U.T. Operation

Operating Environment:

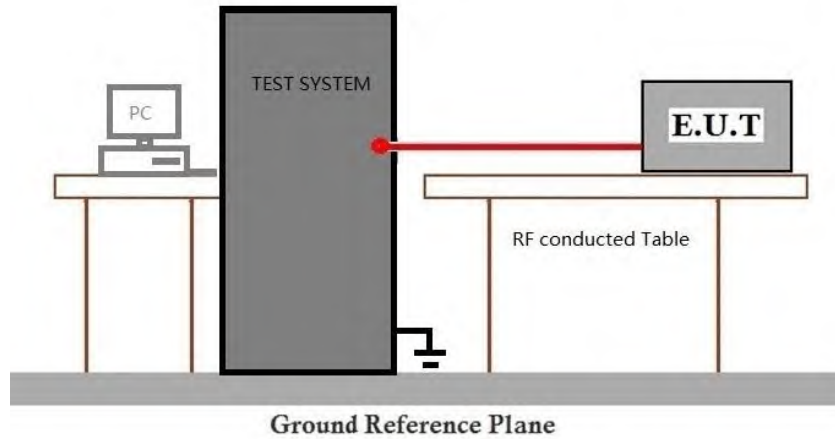
Temperature: 21.6 °C Humidity: 64.3 % RH Atmospheric Pressure: 1020 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	03	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); 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.



7.9.3 Test Setup Diagram



7.9.4 Measurement Procedure and Data

Please Refer to Appendix for Details

8 Test Setup Photo

Refer to SZCR2511005167WM Appendix_Setup Photo-WLAN

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2511005167WM



10 Appendix

1. Duty Cycle

1.1 Test Result

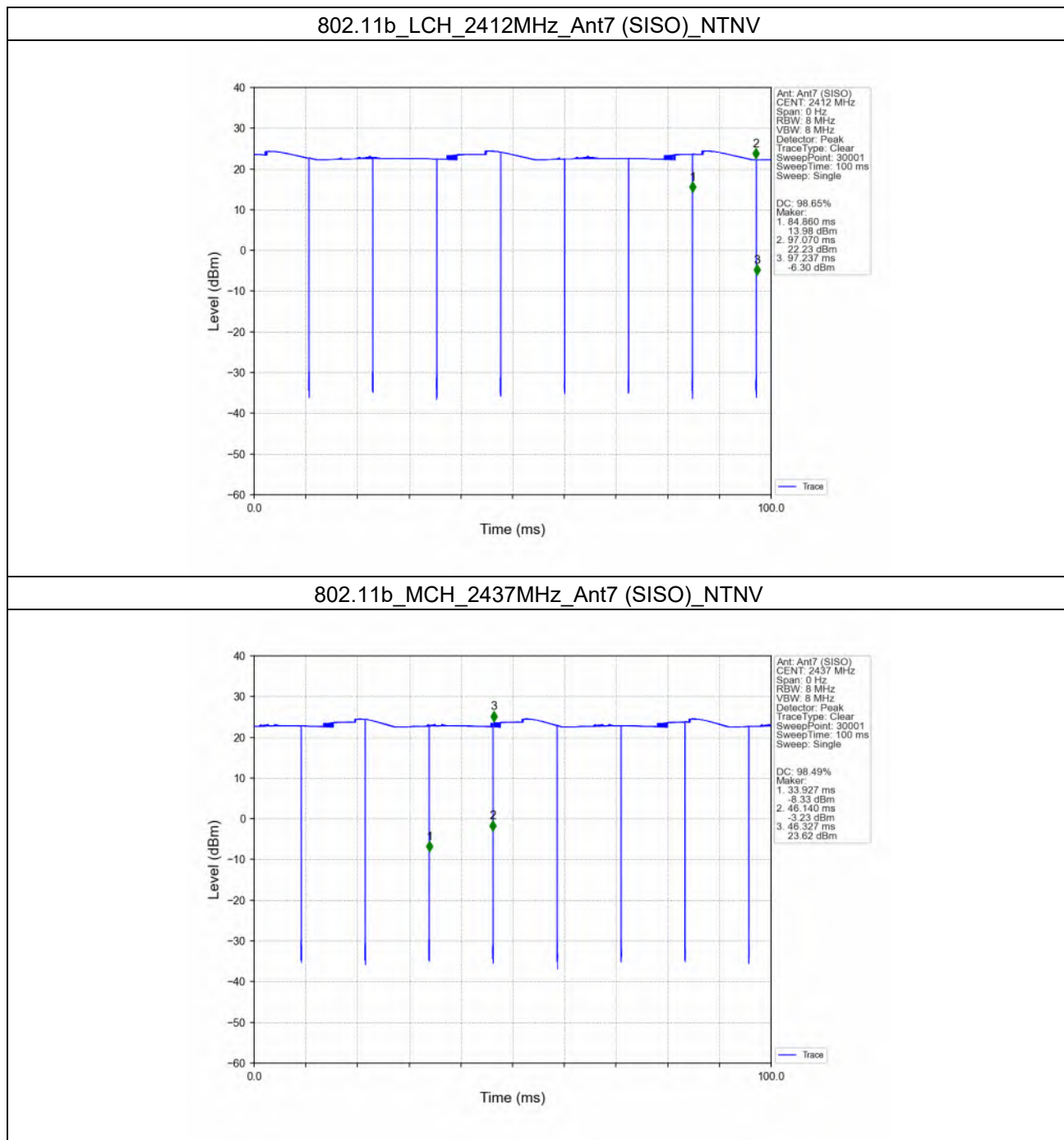
1.1.1 Ant7

Ant7							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	12.210	12.377	98.65	0.06	0.19
		2437	12.213	12.400	98.49	0.07	0.40
		2462	12.210	12.373	98.68	0.06	0.19
802.11g	SISO	2412	2.030	2.065	98.31	0.07	0.04
		2437	2.030	2.065	98.31	0.07	0.03
		2462	2.030	2.065	98.31	0.07	0.04
802.11n (HT20)	SISO	2412	1.889	1.925	98.13	0.08	0.00
		2437	1.890	1.925	98.18	0.08	0.03
		2462	1.890	1.926	98.13	0.08	0.03
802.11n (HT40)	SISO	2422	0.929	0.979	94.89	0.23	0.00
		2437	0.929	0.979	94.89	0.23	0.04
		2452	0.929	0.979	94.89	0.23	0.03

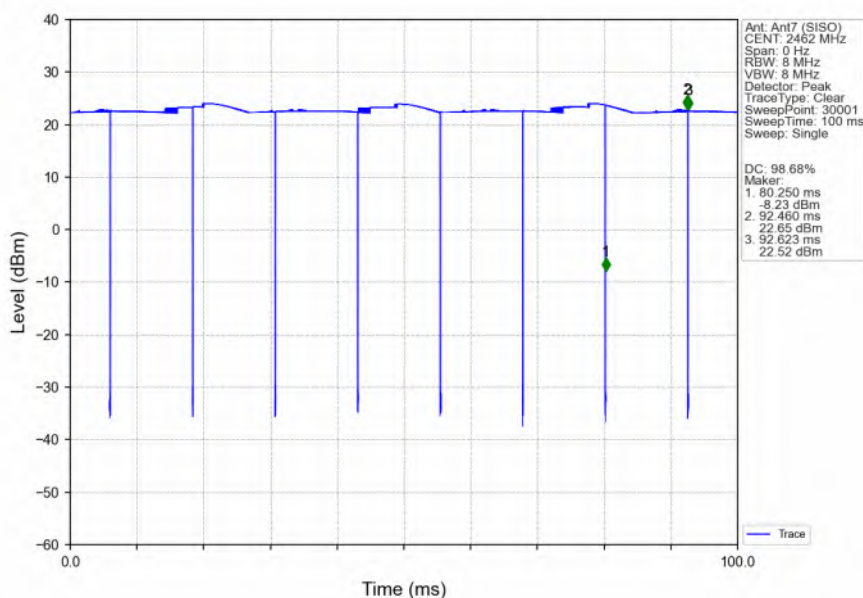


1.2 Test Graph

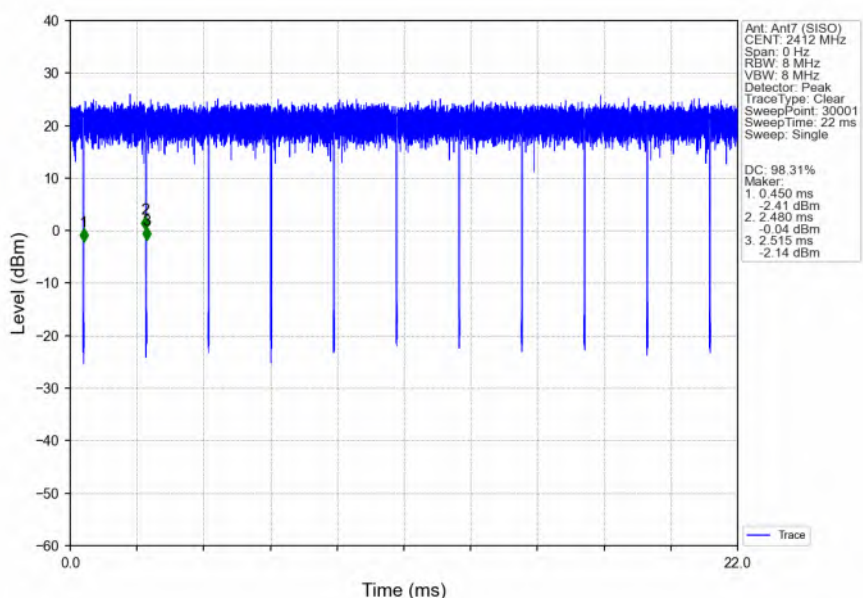
1.2.1 Ant7



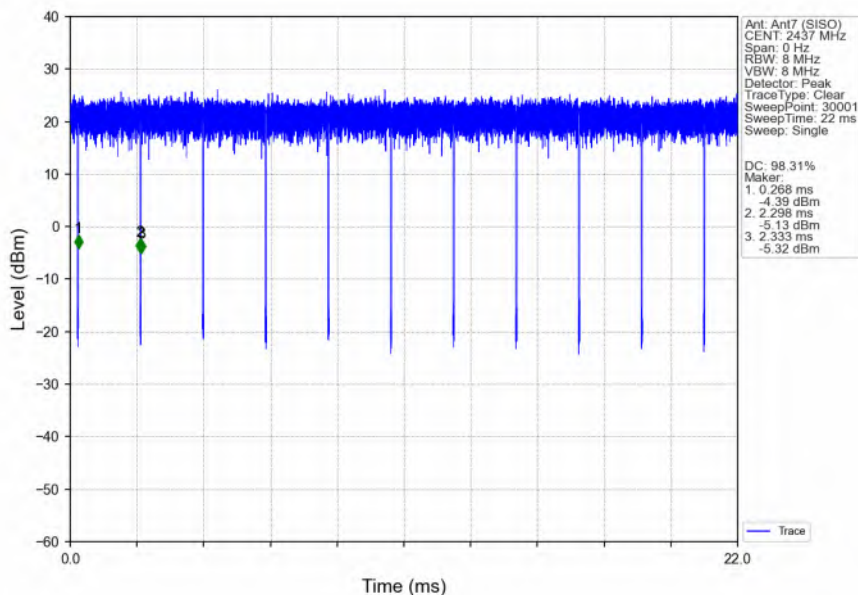
802.11b_HCH_2462MHz_Ant7 (SISO)_NTNV



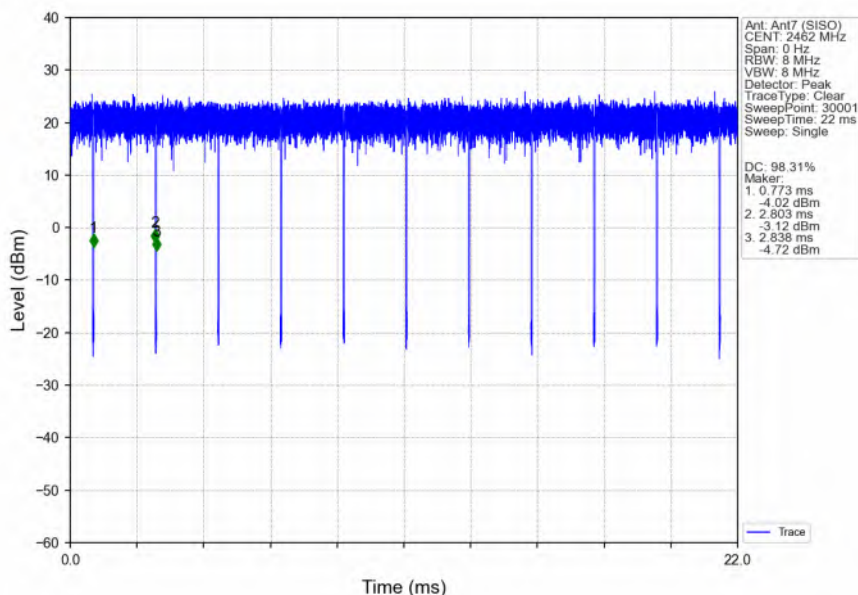
802.11g_LCH_2412MHz_Ant7 (SISO)_NTNV



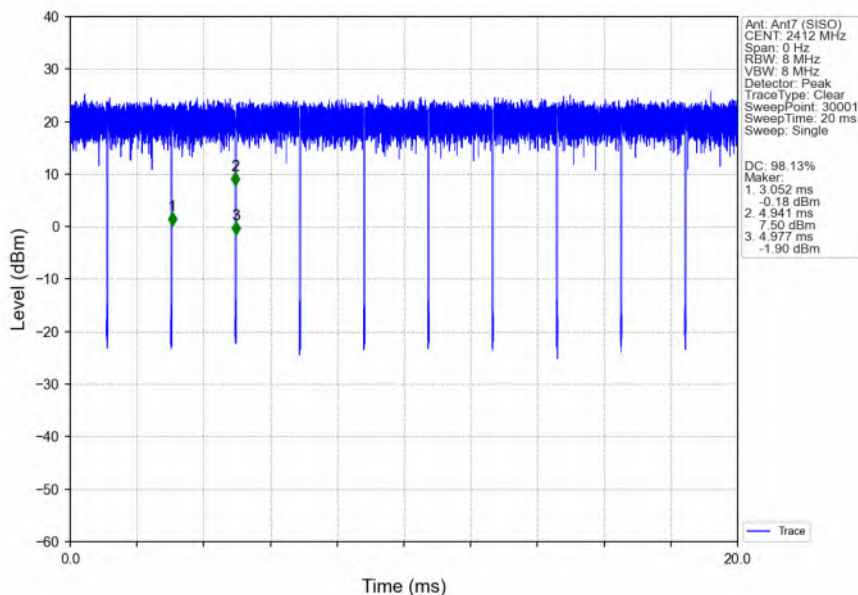
802.11g_MCH_2437MHz_Ant7 (SISO)_NTNV



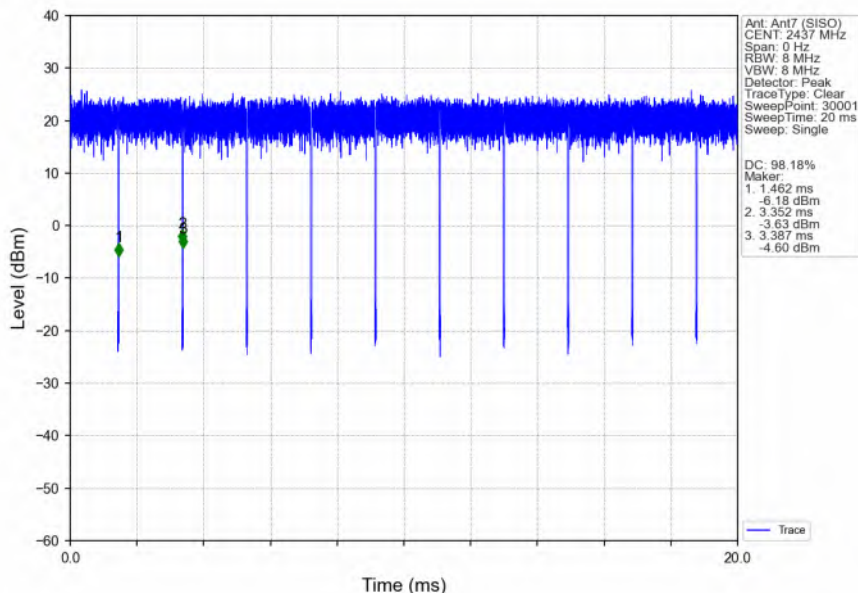
802.11g_HCH_2462MHz_Ant7 (SISO)_NTNV



802.11n(HT20)_LCH_2412MHz_Ant7 (SISO)_NTNV



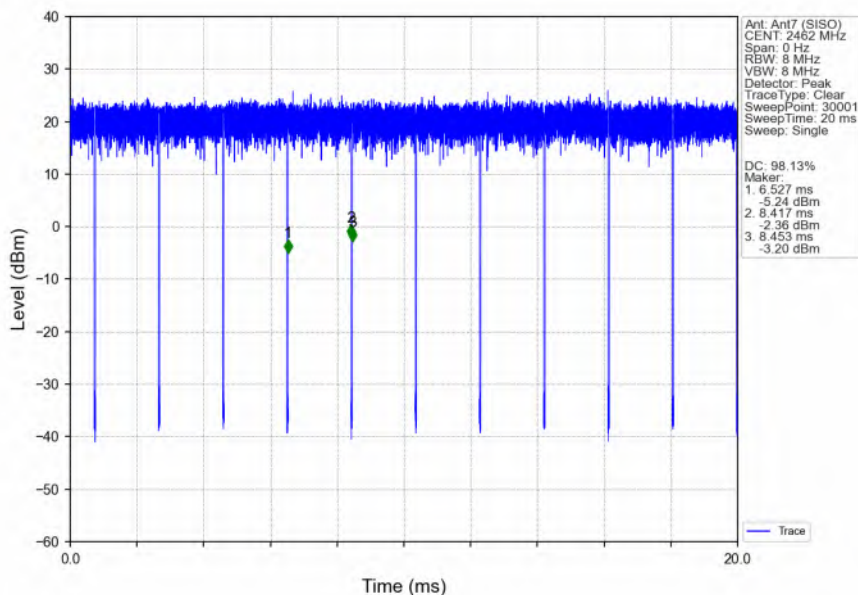
802.11n(HT20)_MCH_2437MHz_Ant7 (SISO)_NTNV



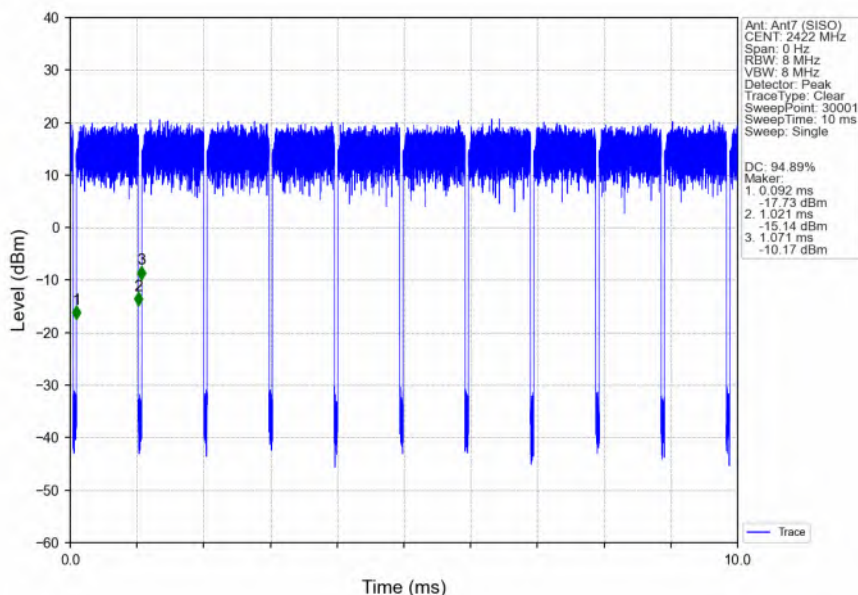
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802.11n(HT20)_HCH_2462MHz_Ant7 (SISO)_NTNV



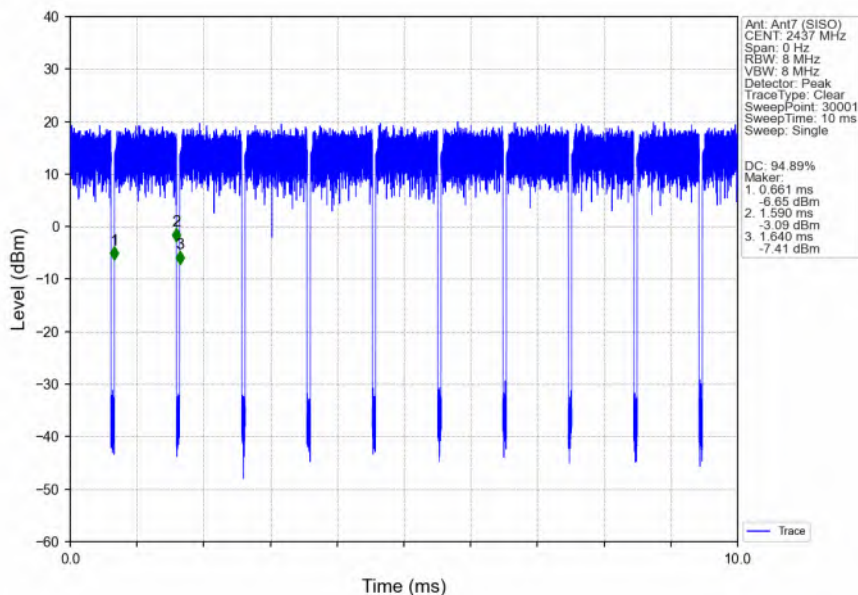
802.11n(HT40)_LCH_2422MHz_Ant7 (SISO)_NTNV



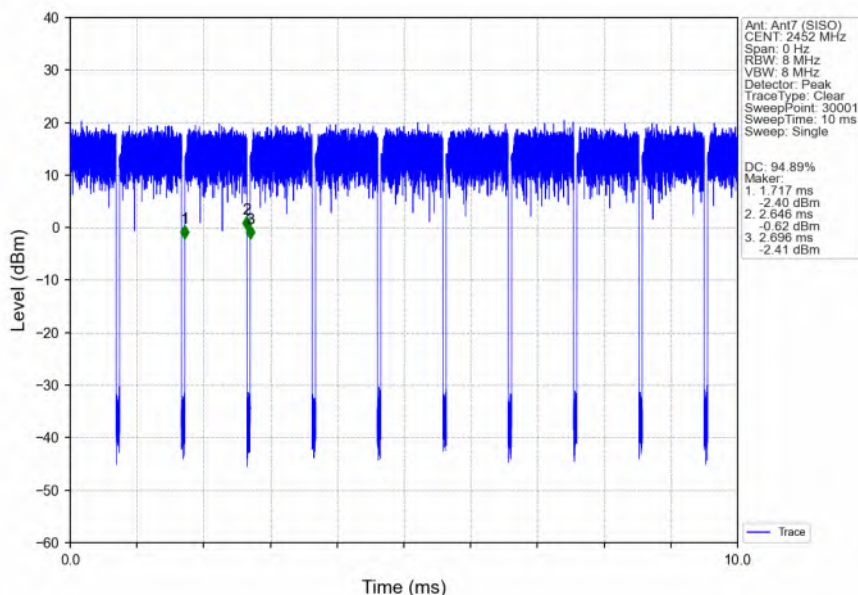
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802.11n(HT40)_MCH_2437MHz_Ant7 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant7 (SISO)_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

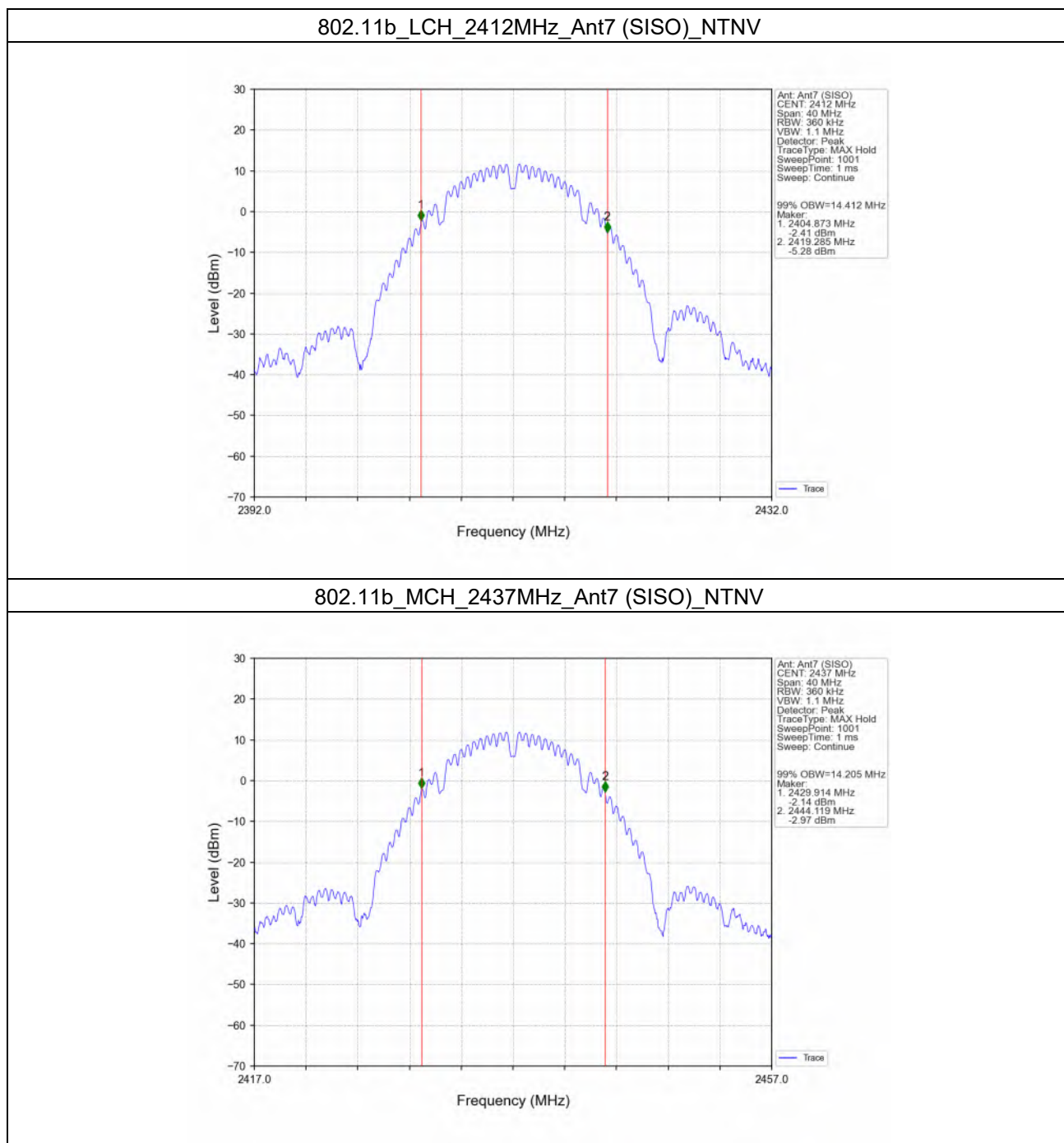
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	7	14.412	/	Pass
		2437	7	14.205	/	Pass
		2462	7	14.185	/	Pass
802.11g	SISO	2412	7	17.570	/	Pass
		2437	7	17.418	/	Pass
		2462	7	17.534	/	Pass
802.11n (HT20)	SISO	2412	7	18.560	/	Pass
		2437	7	18.483	/	Pass
		2462	7	18.531	/	Pass
802.11n (HT40)	SISO	2422	7	36.603	/	Pass
		2437	7	36.610	/	Pass
		2452	7	36.590	/	Pass

2.1.2 6dB BW

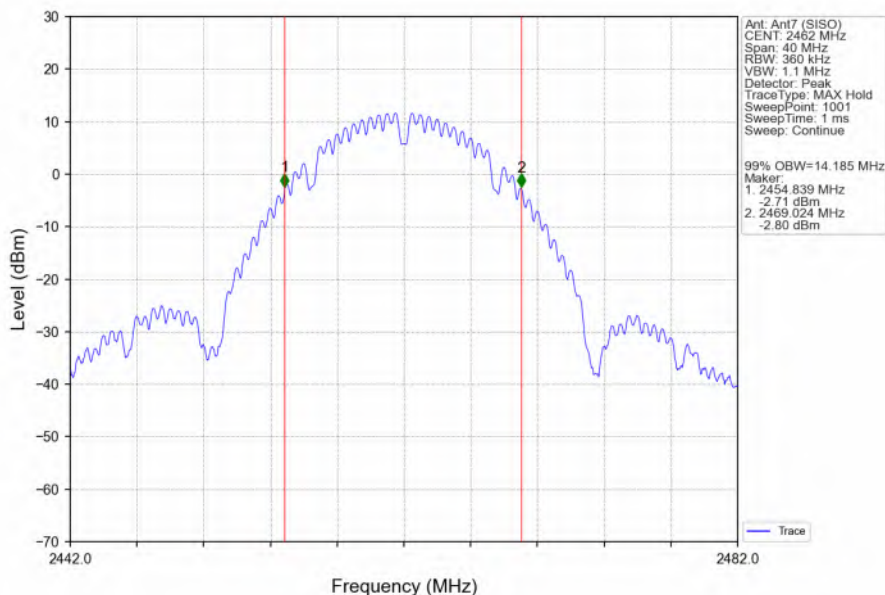
Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	7	9.230	≥ 0.5	Pass
		2437	7	9.218	≥ 0.5	Pass
		2462	7	9.203	≥ 0.5	Pass
802.11g	SISO	2412	7	16.434	≥ 0.5	Pass
		2437	7	16.328	≥ 0.5	Pass
		2462	7	16.492	≥ 0.5	Pass
802.11n (HT20)	SISO	2412	7	17.616	≥ 0.5	Pass
		2437	7	17.696	≥ 0.5	Pass
		2462	7	17.620	≥ 0.5	Pass
802.11n (HT40)	SISO	2422	7	36.075	≥ 0.5	Pass
		2437	7	36.264	≥ 0.5	Pass
		2452	7	36.073	≥ 0.5	Pass

2.2 Test Graph

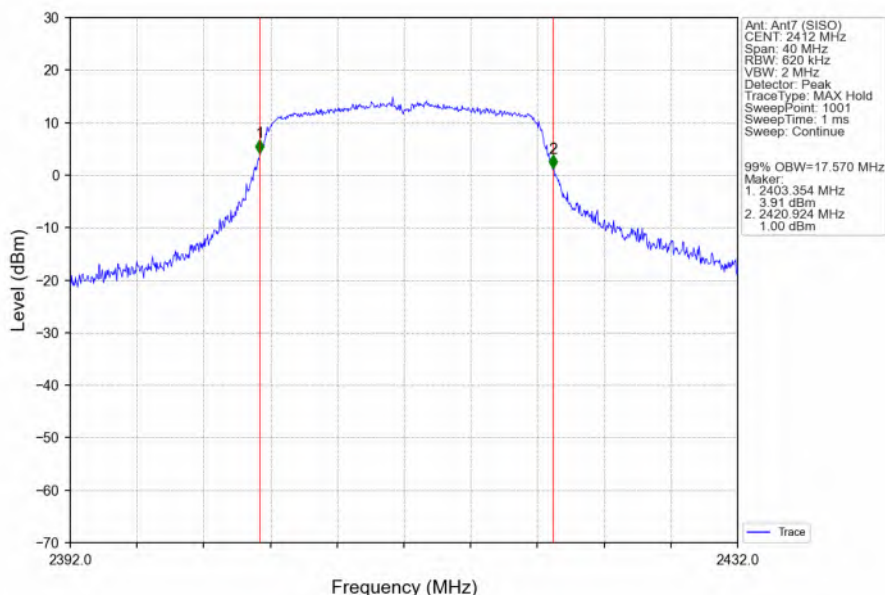
2.2.1 OBW



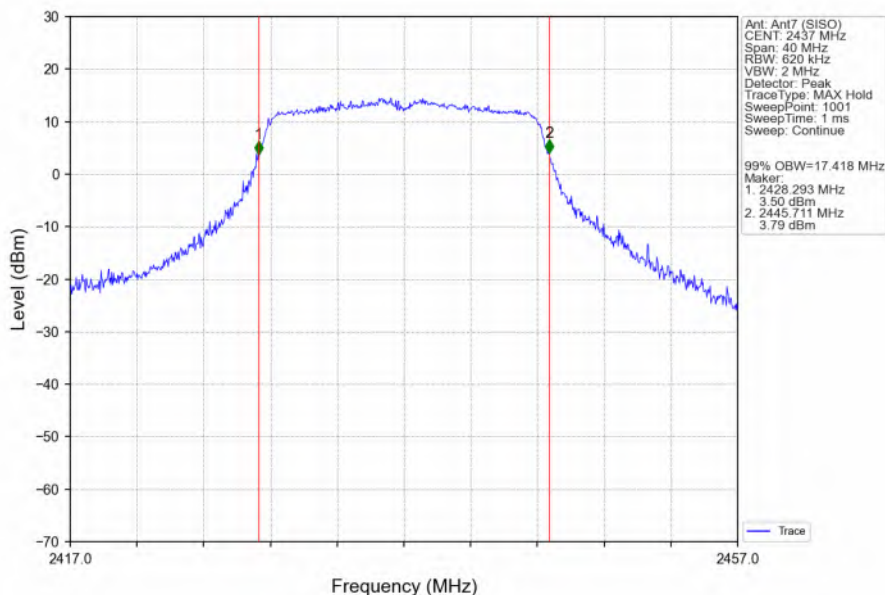
802.11b_HCH_2462MHz_Ant7 (SISO)_NTNV



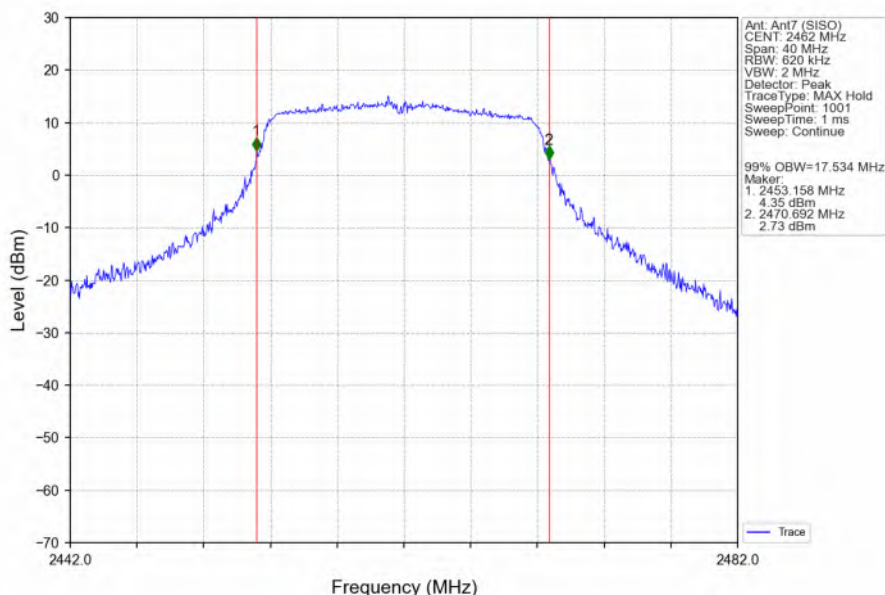
802.11g_LCH_2412MHz_Ant7 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant7 (SISO)_NTNV



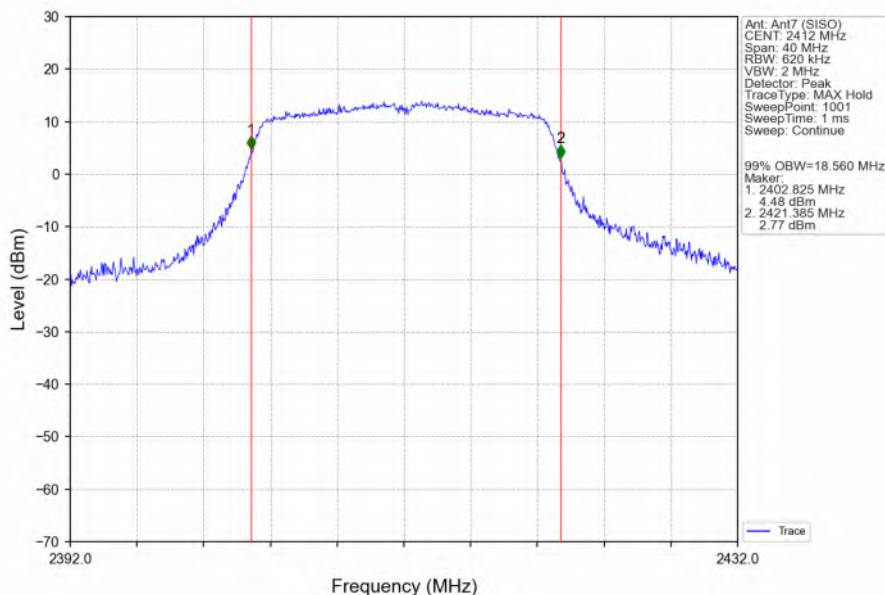
802.11g_HCH_2462MHz_Ant7 (SISO)_NTNV



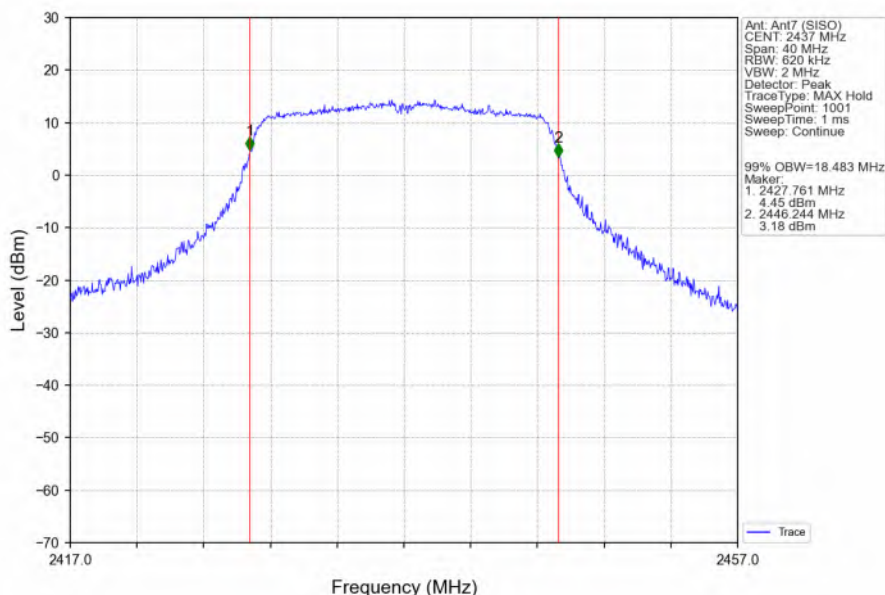
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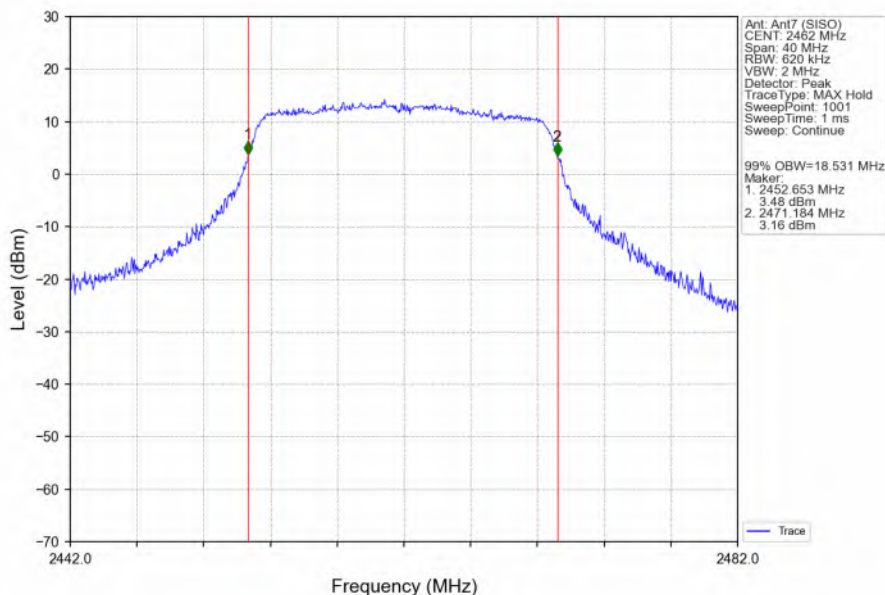
802.11n(HT20)_LCH_2412MHz_Ant7 (SISO)_NTNV



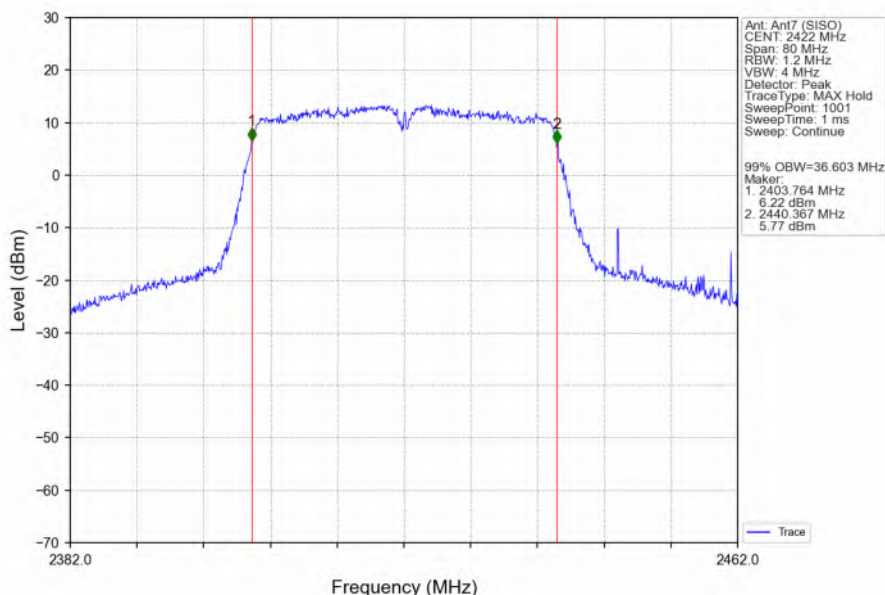
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802.11n(HT20)_HCH_2462MHz_Ant7 (SISO)_NTNV



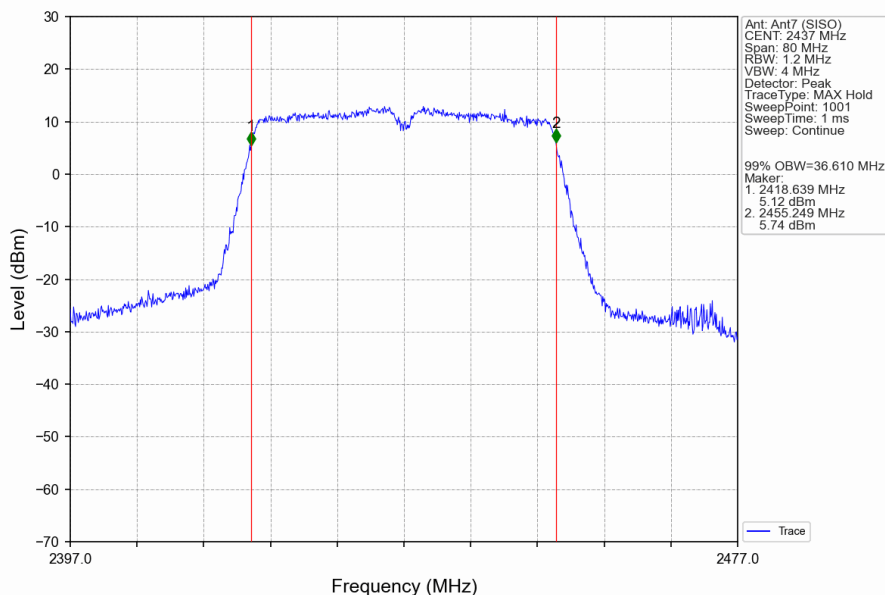
802.11n(HT40)_LCH_2422MHz_Ant7 (SISO)_NTNV



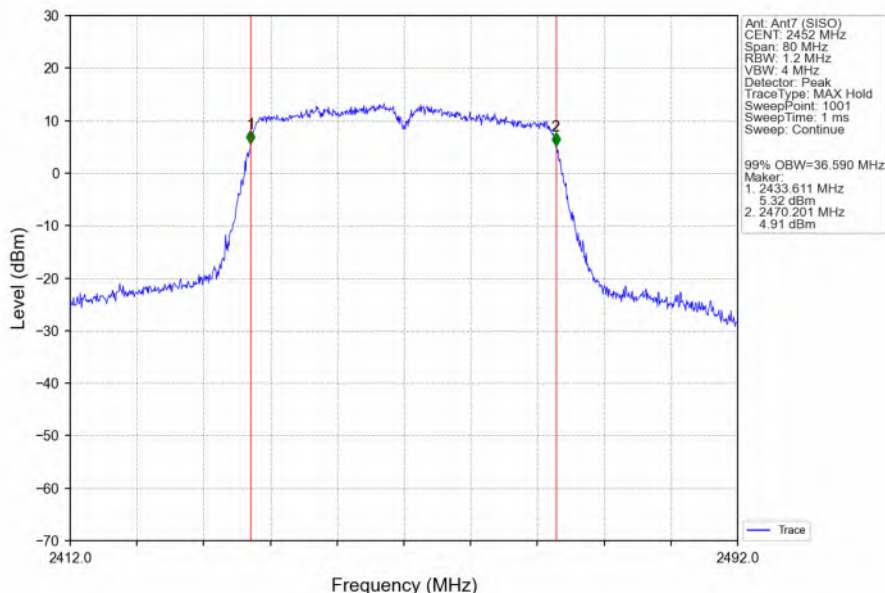
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802.11n(HT40)_MCH_2437MHz_Ant7 (SISO)_NTNV

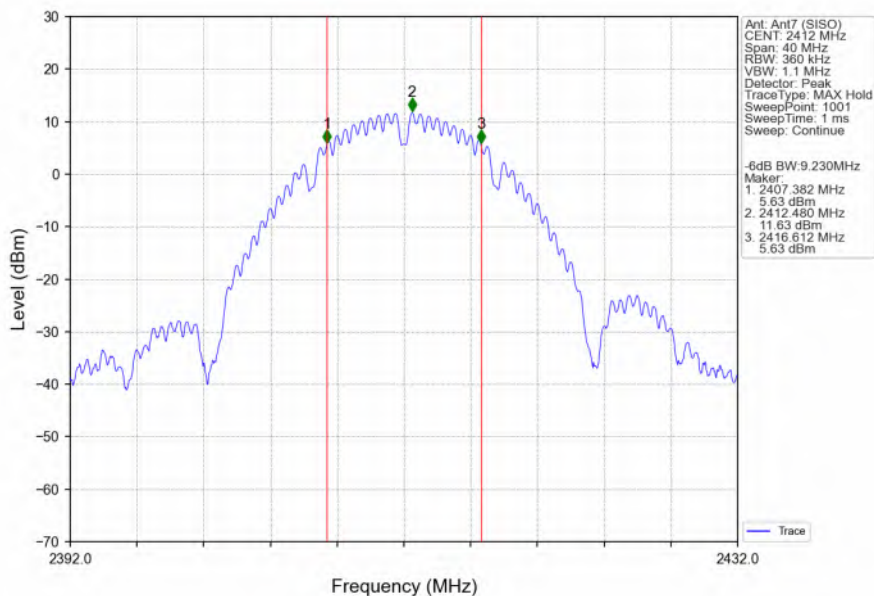


802.11n(HT40)_HCH_2452MHz_Ant7 (SISO)_NTNV

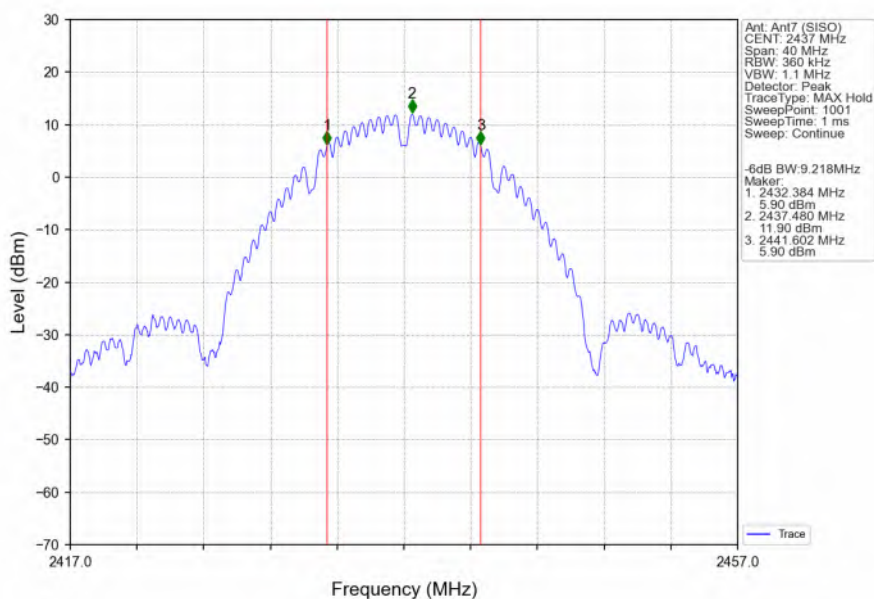


2.2.2 6dB BW

802.11b_LCH_2412MHz_Ant7 (SISO)_NTNV



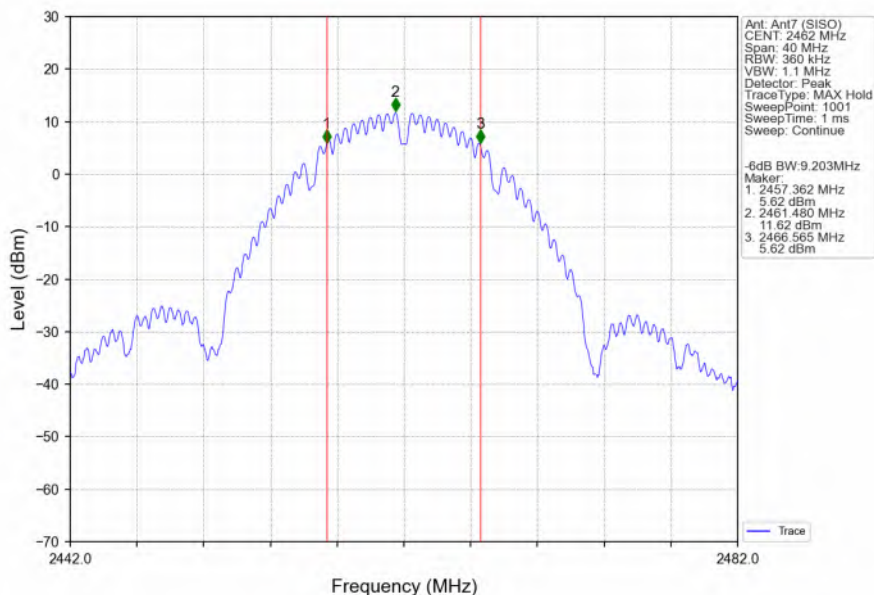
802.11b_MCH_2437MHz_Ant7 (SISO)_NTNV



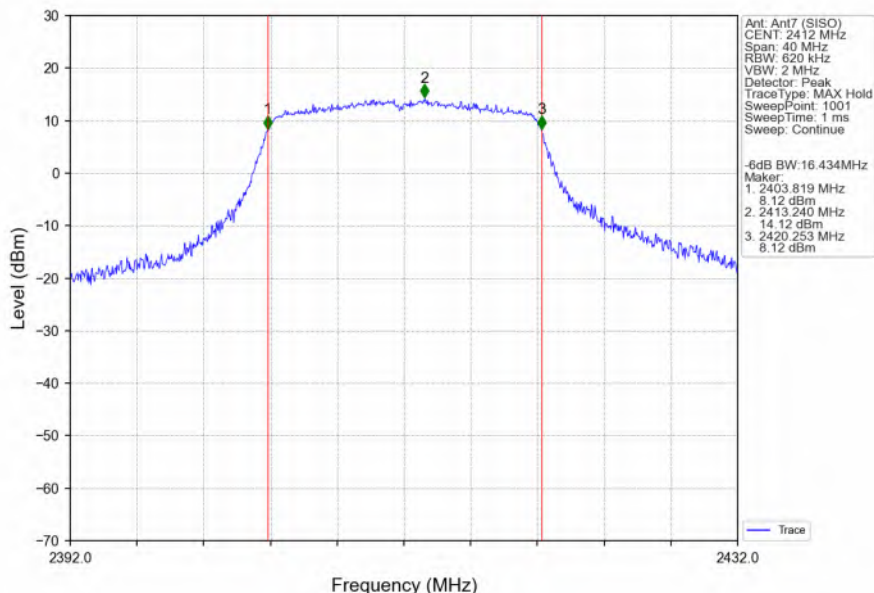
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802.11b_HCH_2462MHz_Ant7 (SISO)_NTNV



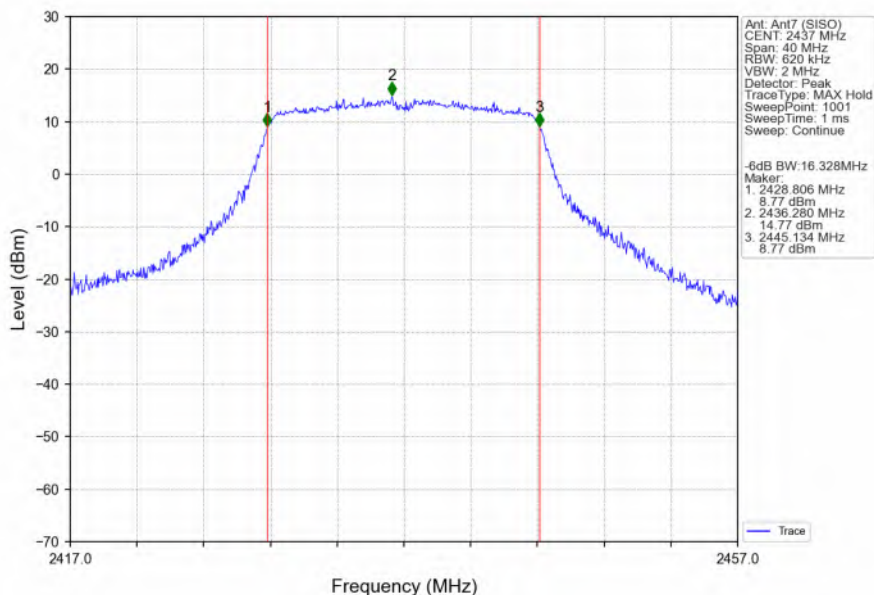
802.11g_LCH_2412MHz_Ant7 (SISO)_NTNV



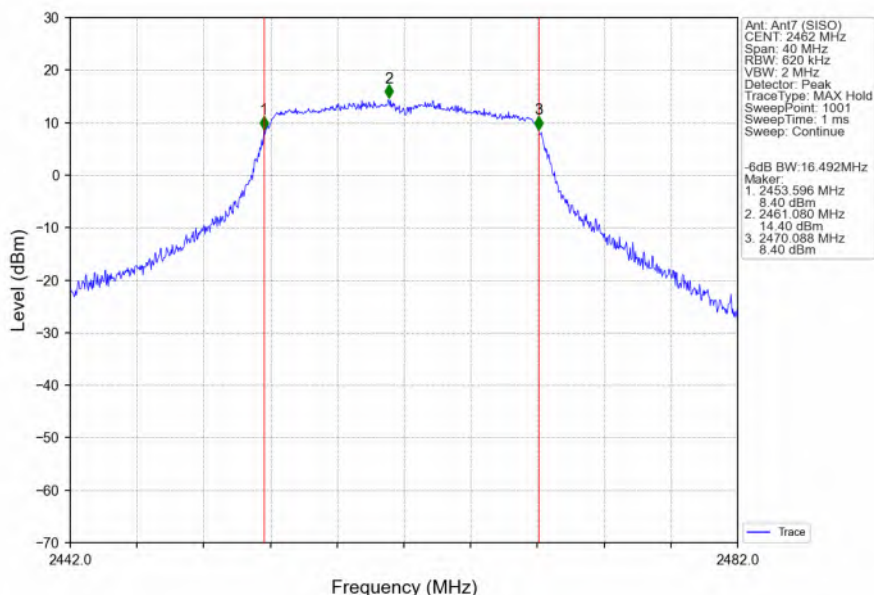
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802.11g_MCH_2437MHz_Ant7 (SISO)_NTNV



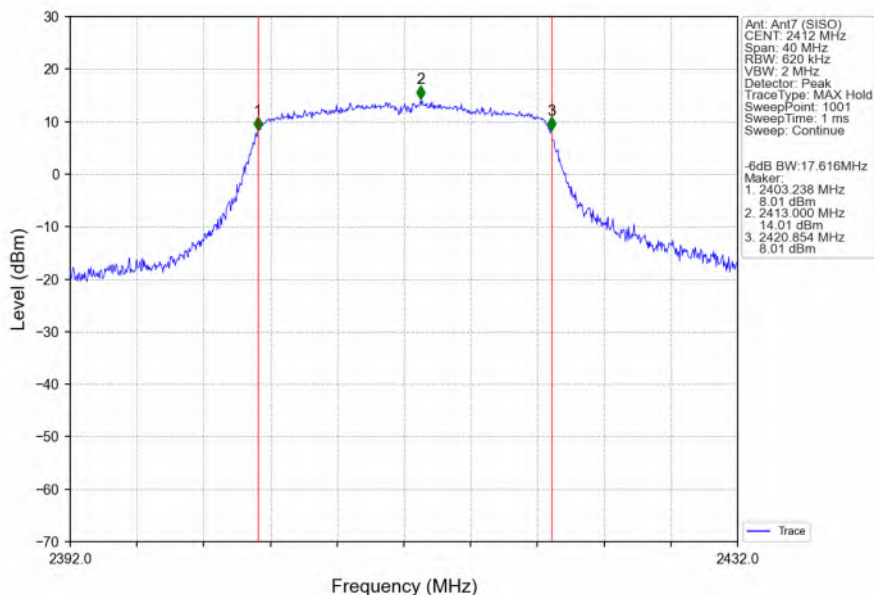
802.11g_HCH_2462MHz_Ant7 (SISO)_NTNV



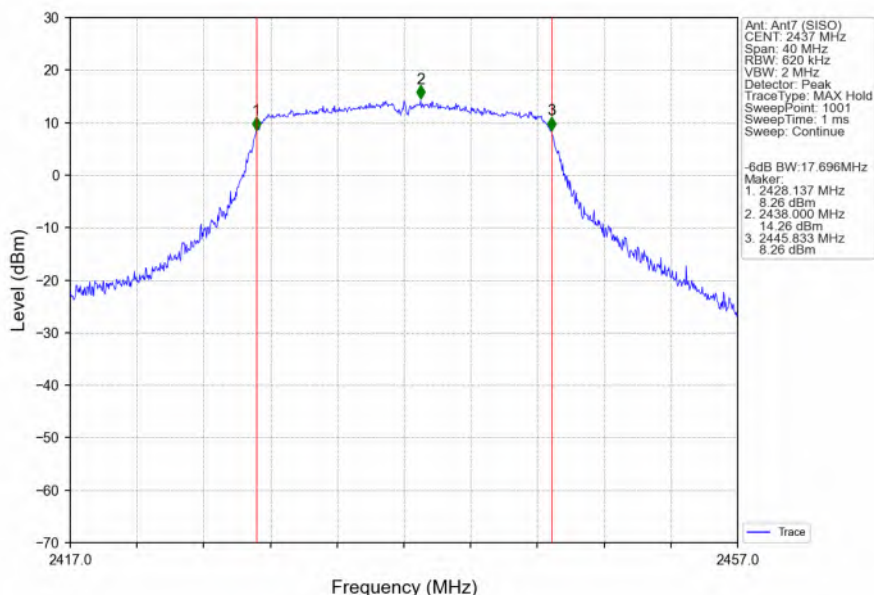
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802.11n(HT20)_LCH_2412MHz_Ant7 (SISO)_NTNV



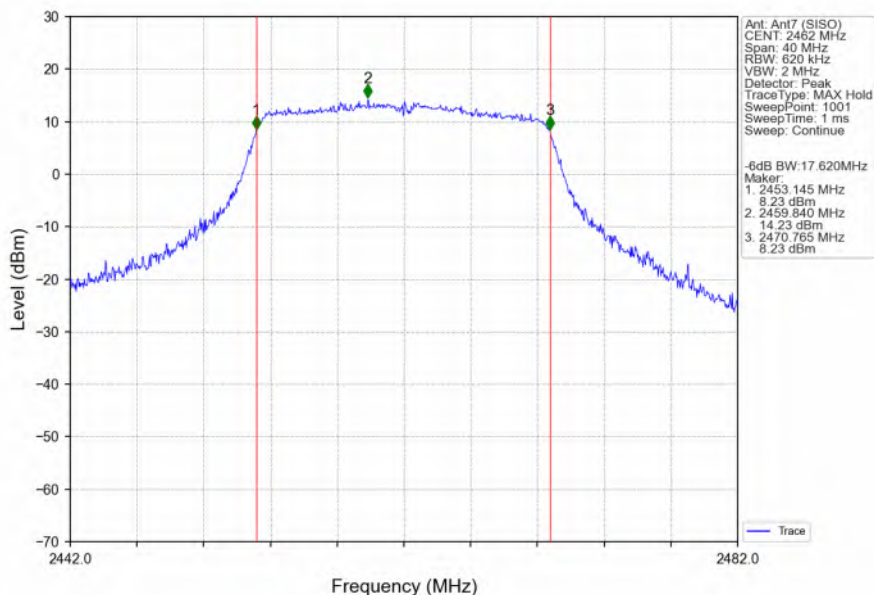
802.11n(HT20)_MCH_2437MHz_Ant7 (SISO)_NTNV



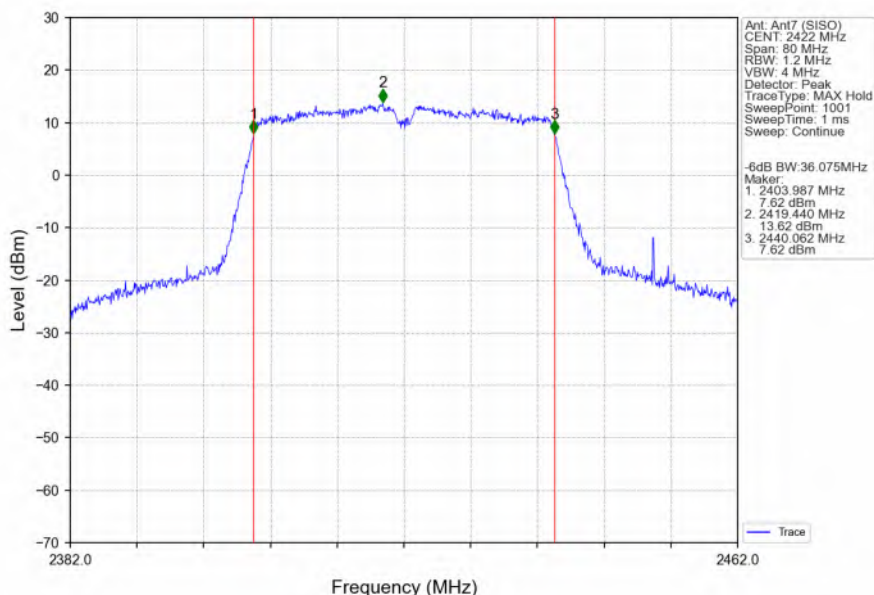
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802.11n(HT20)_HCH_2462MHz_Ant7 (SISO)_NTNV



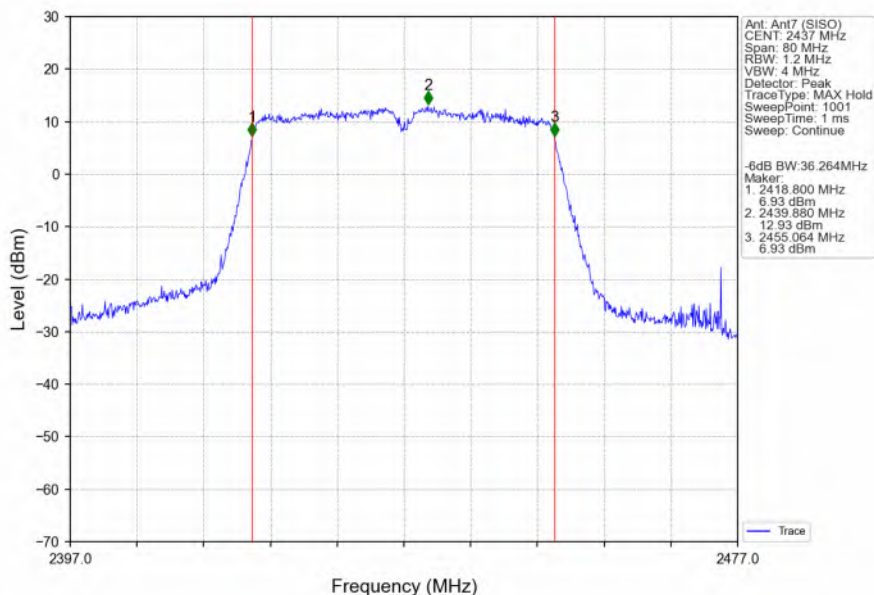
802.11n(HT40)_LCH_2422MHz_Ant7 (SISO)_NTNV



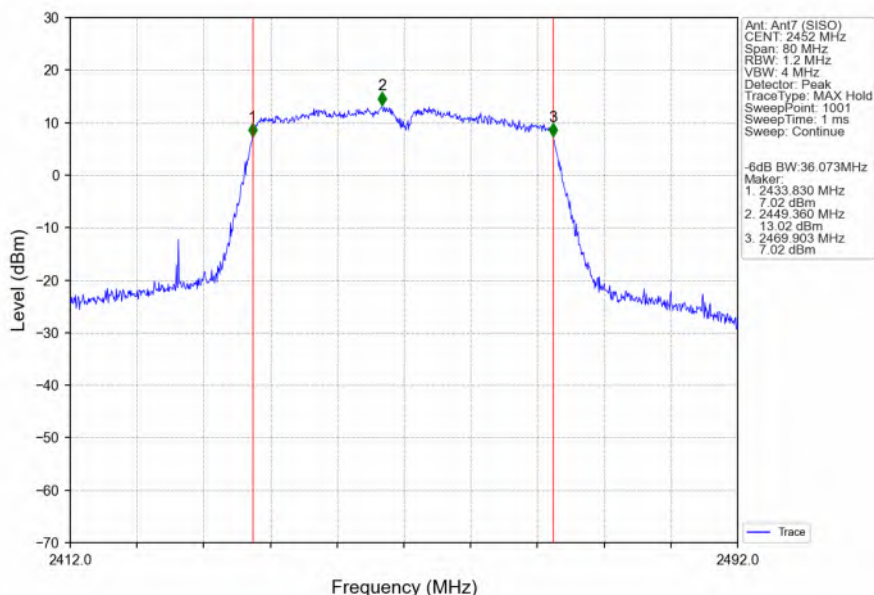
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802.11n(HT40)_MCH_2437MHz_Ant7 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant7 (SISO)_NTNV



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3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)		Verdict
			ANT7	Limit	
802.11b	SISO	2412	19.69	<=30	Pass
		2437	19.83	<=30	Pass
		2462	19.57	<=30	Pass
802.11g	SISO	2412	18.98	<=30	Pass
		2437	19.23	<=30	Pass
		2462	18.92	<=30	Pass
802.11n (HT20)	SISO	2412	18.83	<=30	Pass
		2437	19.12	<=30	Pass
		2462	18.82	<=30	Pass
802.11n (HT40)	SISO	2422	17.40	<=30	Pass
		2437	16.83	<=30	Pass
		2452	16.85	<=30	Pass

Note1: Antenna Gain: Ant7: -4.55dBi;

4. Maximum Power Spectral Density

4.1 Test Result

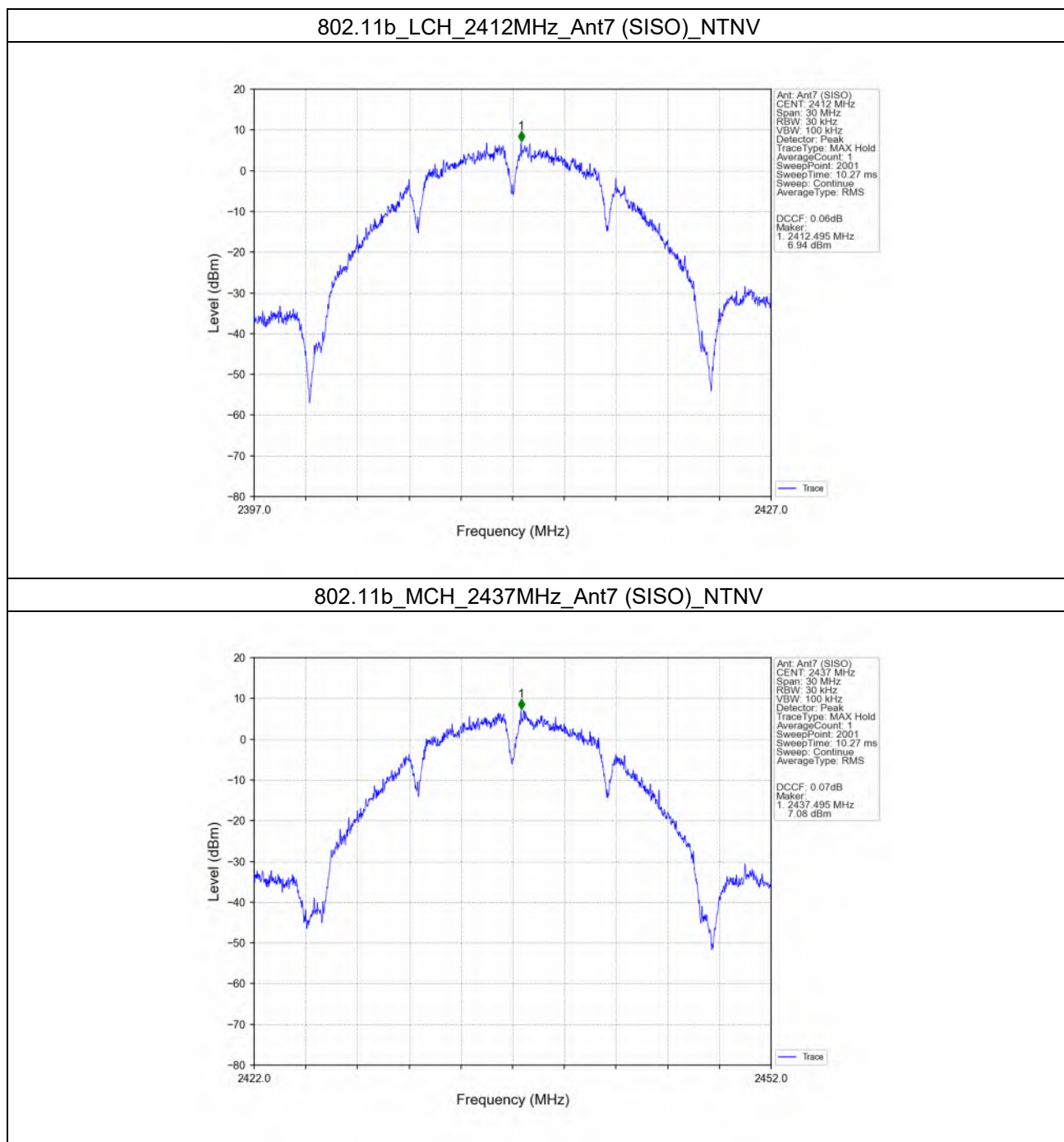
4.1.1 PSD

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm)		Verdict
			ANT7	Limit	
802.11b	SISO	2412	6.94	<=8	Pass
		2437	7.08	<=8	Pass
		2462	7.20	<=8	Pass
802.11g	SISO	2412	4.01	<=8	Pass
		2437	4.29	<=8	Pass
		2462	3.64	<=8	Pass
802.11n (HT20)	SISO	2412	4.28	<=8	Pass
		2437	4.93	<=8	Pass
		2462	4.68	<=8	Pass
802.11n (HT40)	SISO	2422	4.43	<=8	Pass
		2437	3.60	<=8	Pass
		2452	3.97	<=8	Pass

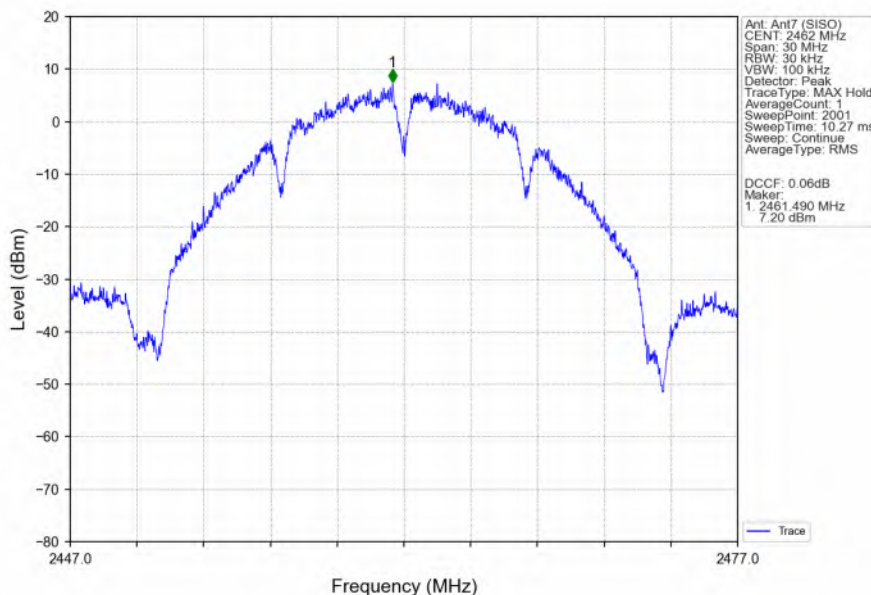
Note1: Antenna Gain: Ant7: -4.55dBi;

4.2 Test Graph

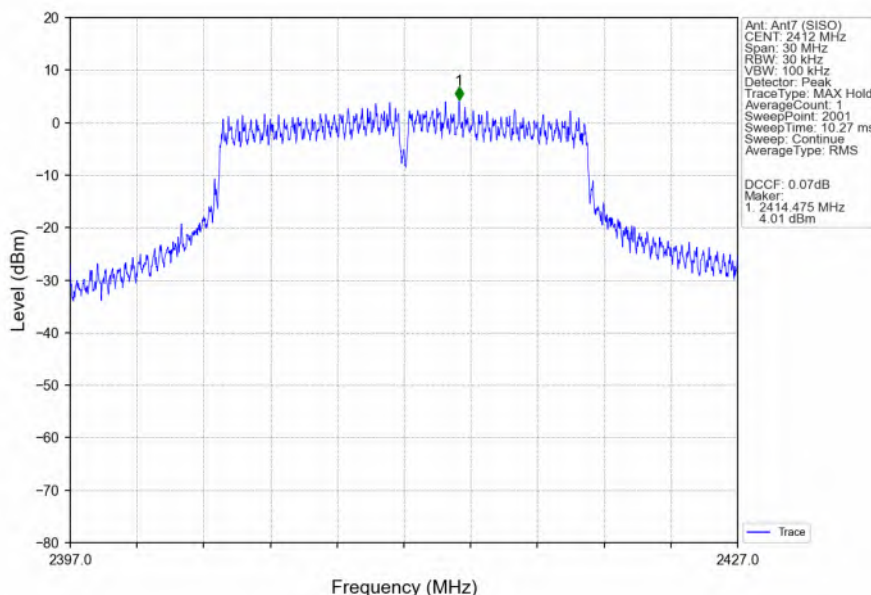
4.2.1 PSD



802.11b_HCH_2462MHz_Ant7 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant7 (SISO)_NTNV



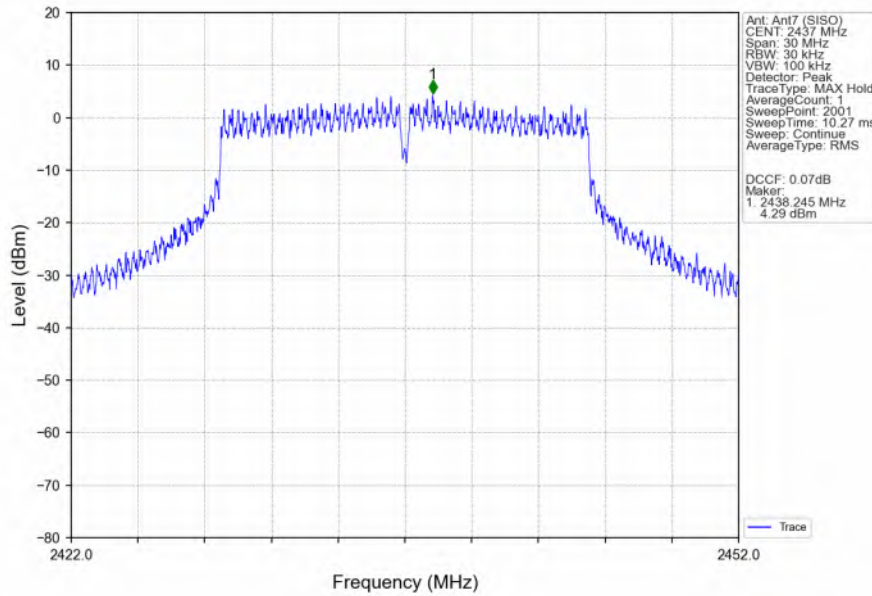
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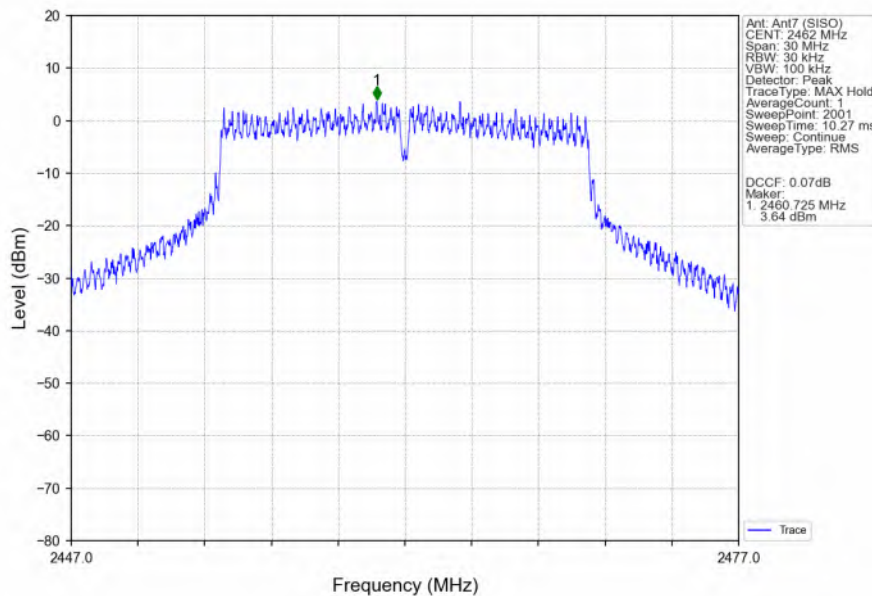
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802.11g_MCH_2437MHz_Ant7 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant7 (SISO)_NTNV



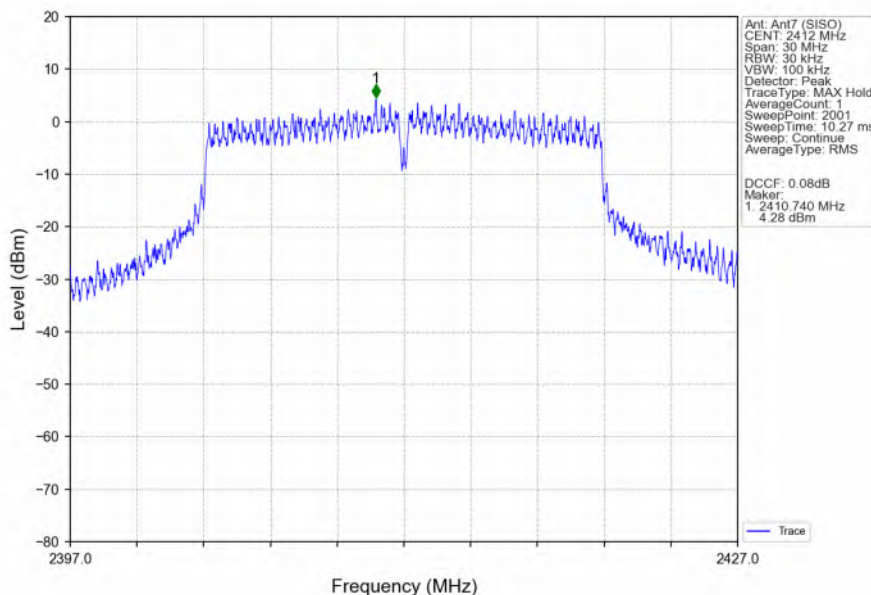
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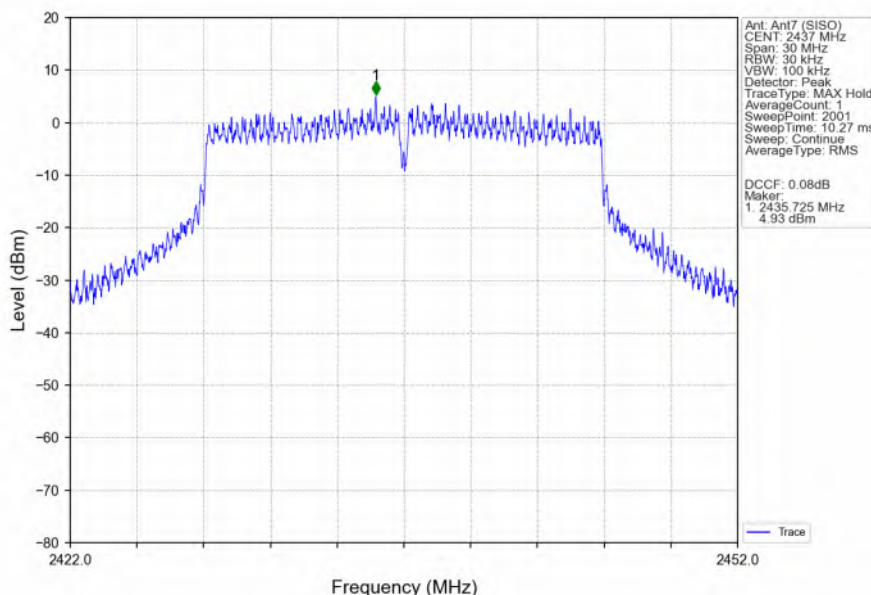
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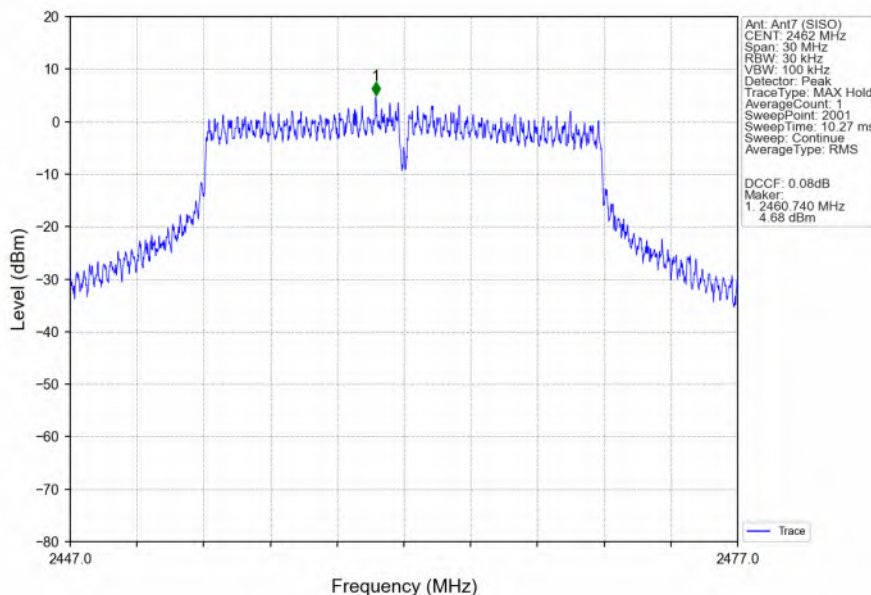
802.11n(HT20)_LCH_2412MHz_Ant7 (SISO)_NTNV



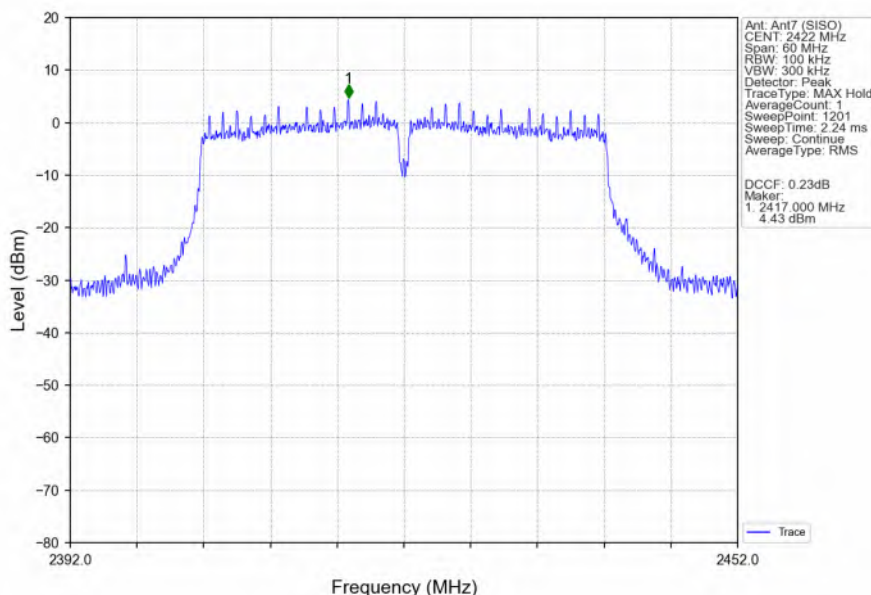
802.11n(HT20)_MCH_2437MHz_Ant7 (SISO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant7 (SISO)_NTNV



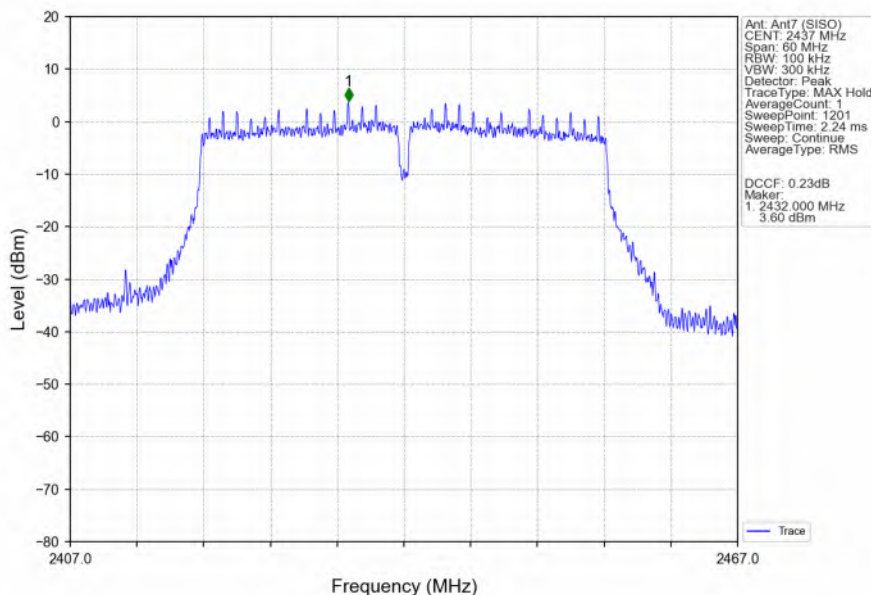
802.11n(HT40)_LCH_2422MHz_Ant7 (SISO)_NTNV



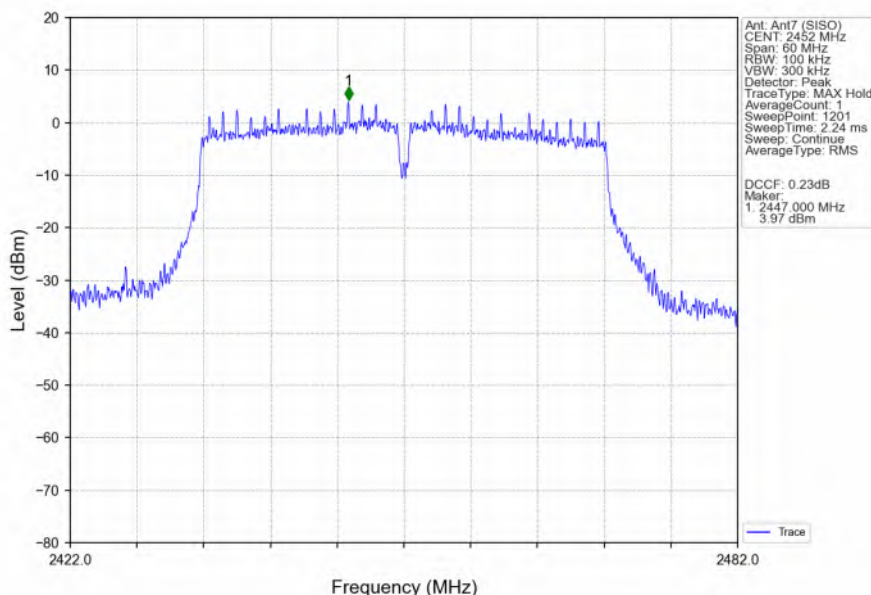
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802.11n(HT40)_MCH_2437MHz_Ant7 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant7 (SISO)_NTNV



5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Test Result

5.1.1 Ref

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	7	11.16
		2437	7	11.48
		2462	7	11.26
802.11g	SISO	2412	7	9.49
		2437	7	9.63
		2462	7	9.52
802.11n (HT20)	SISO	2412	7	9.61
		2437	7	9.94
		2462	7	9.50
802.11n (HT40)	SISO	2422	7	4.46
		2437	7	3.57
		2452	7	3.60

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.

5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	7	11.48	-18.52	Pass
		2437	7	11.48	-18.52	Pass
		2462	7	11.48	-18.52	Pass
802.11g	SISO	2412	7	9.63	-20.37	Pass
		2437	7	9.63	-20.37	Pass
		2462	7	9.63	-20.37	Pass
802.11n (HT20)	SISO	2412	7	9.94	-20.06	Pass
		2437	7	9.94	-20.06	Pass
		2462	7	9.94	-20.06	Pass
802.11n (HT40)	SISO	2422	7	4.46	-25.54	Pass
		2437	7	4.46	-25.54	Pass
		2452	7	4.46	-25.54	Pass

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2020, the channel contains the maximum PSD level was used to establish the reference level.



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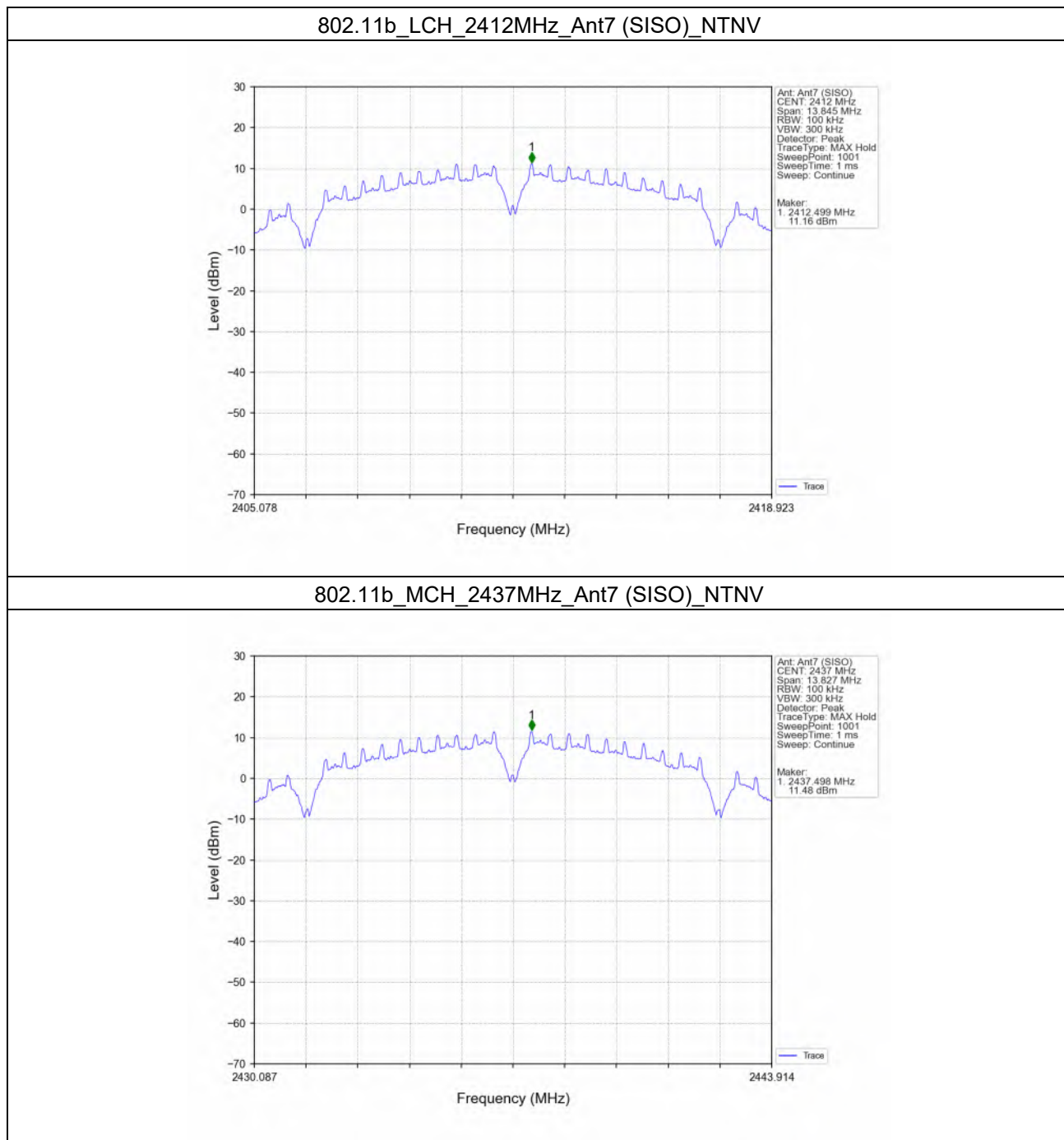
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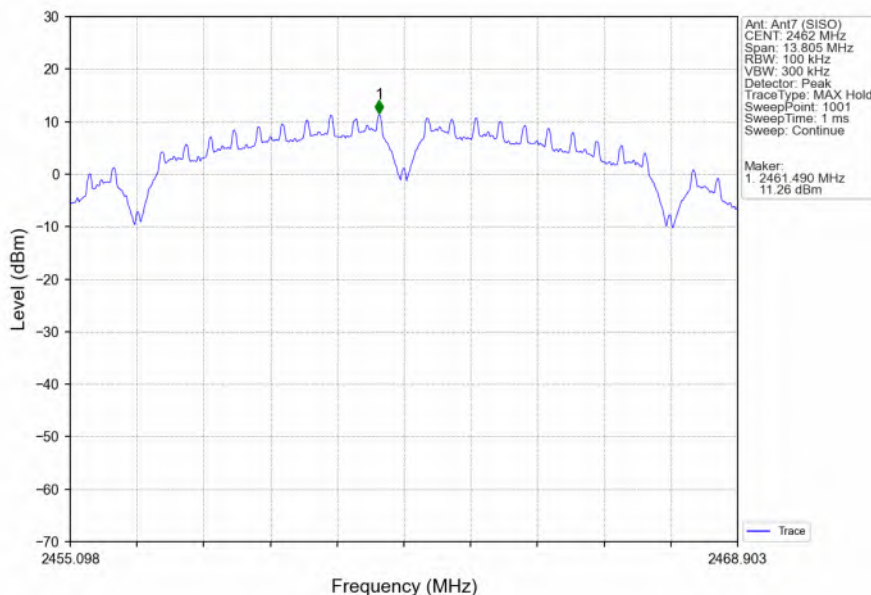
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5.2 Test Graph

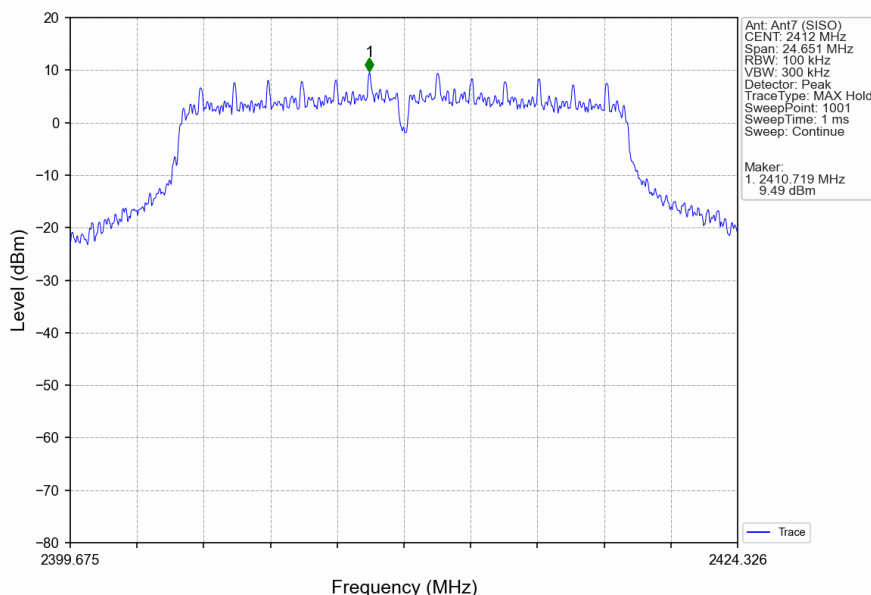
5.2.1 Ref



802.11b_HCH_2462MHz_Ant7 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant7 (SISO)_NTNV



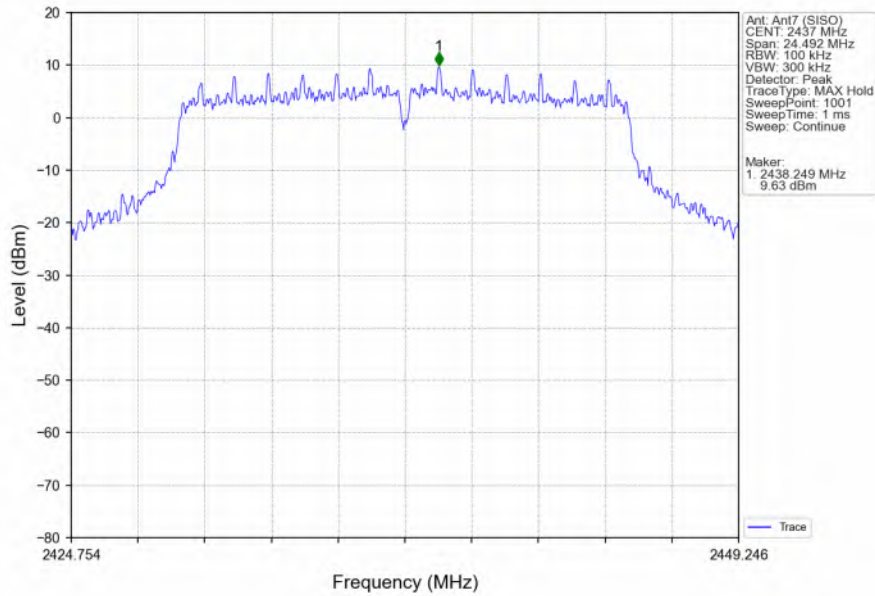
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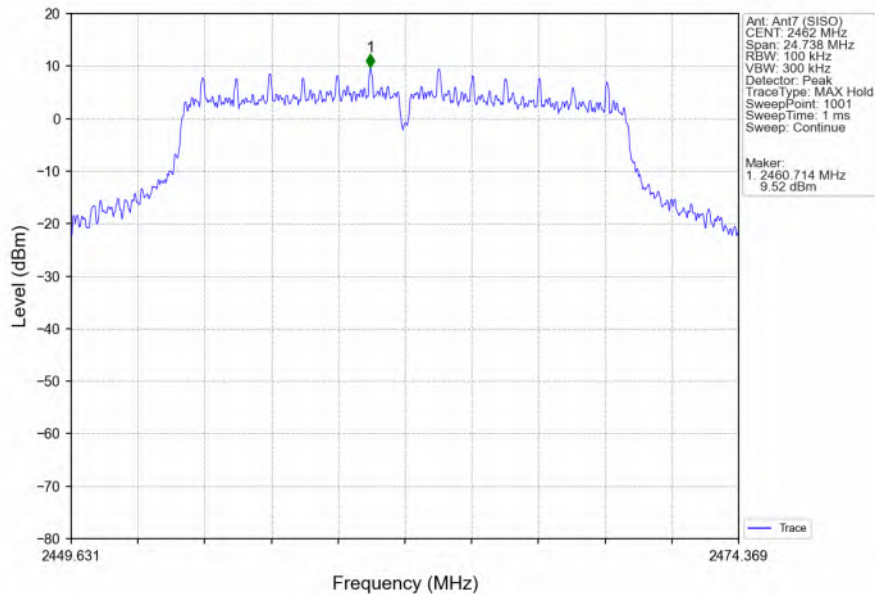
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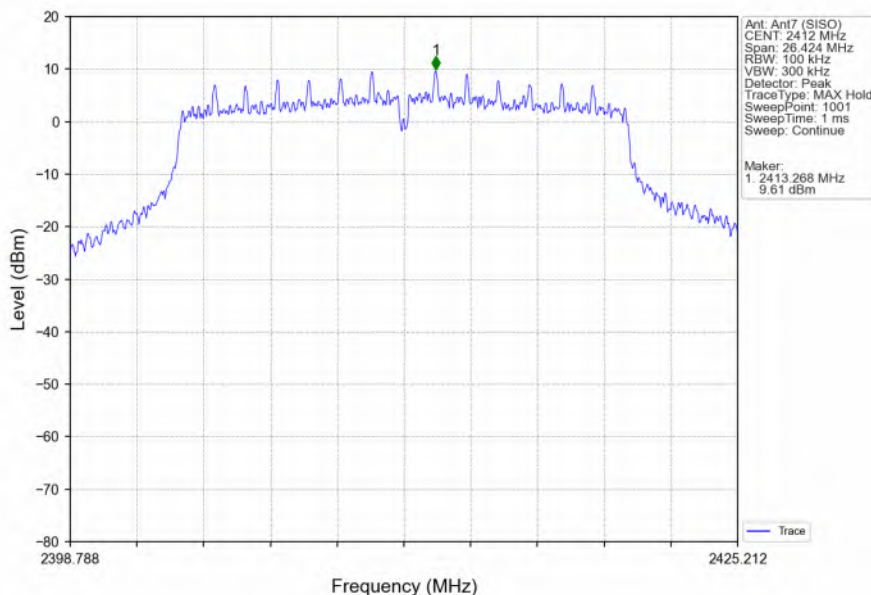
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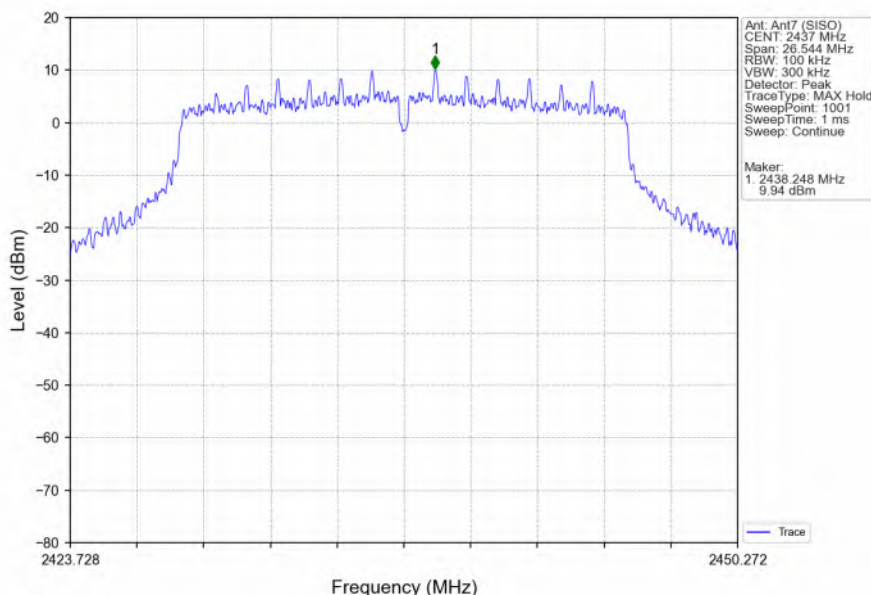
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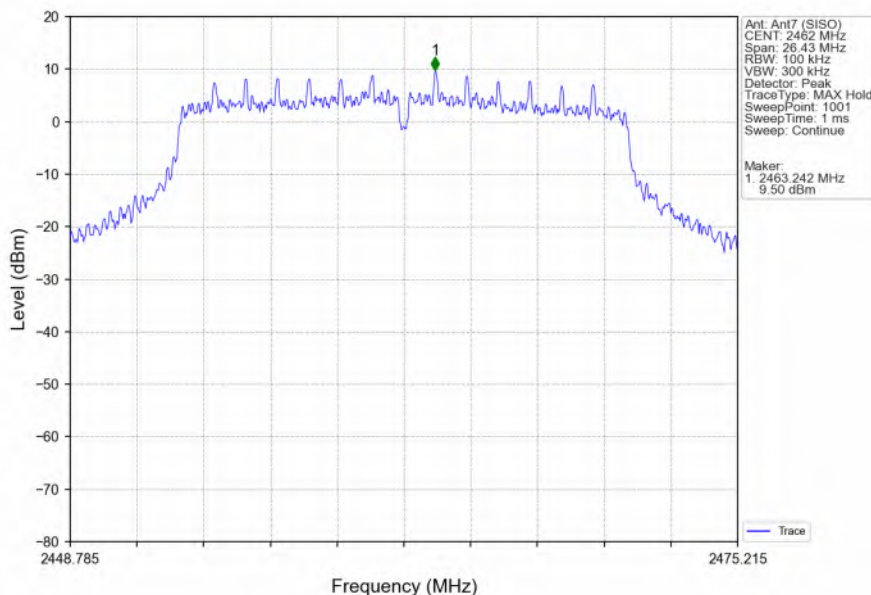
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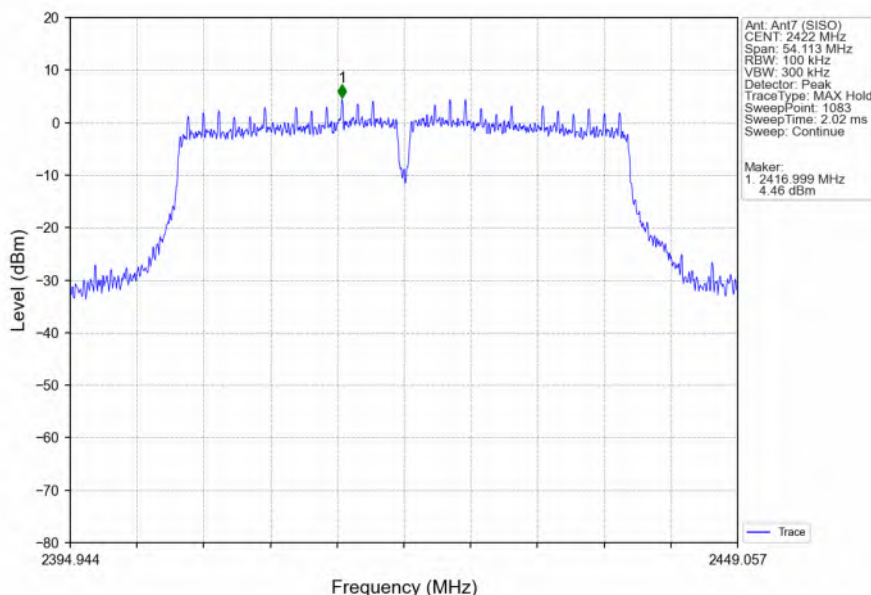
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802.11n(HT20)_HCH_2462MHz_Ant7 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant7 (SISO)_NTNV



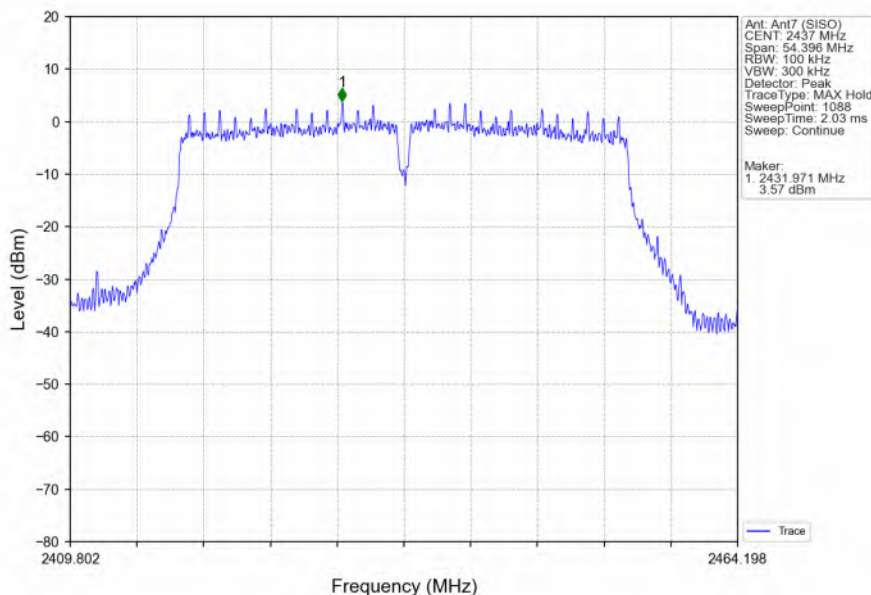
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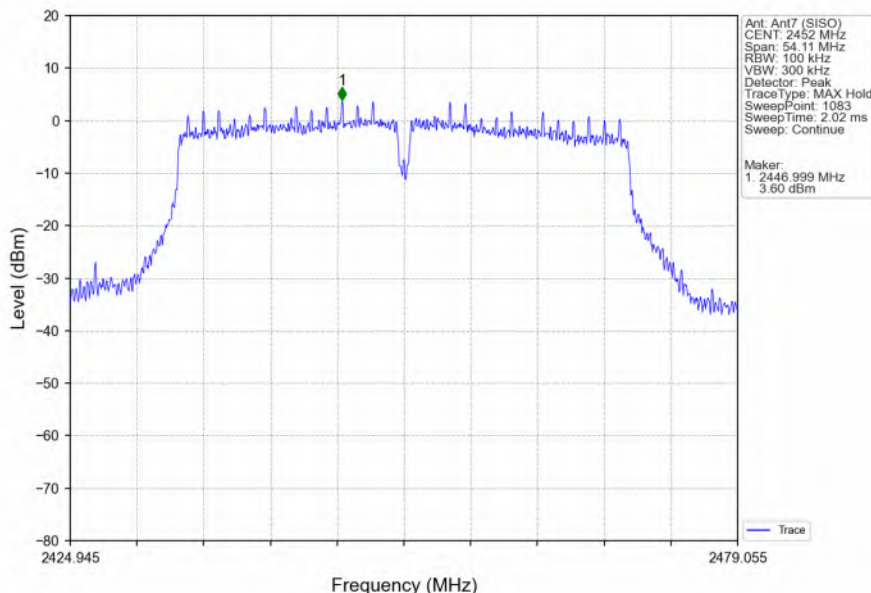
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802.11n(HT40)_MCH_2437MHz_Ant7 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant7 (SISO)_NTNV



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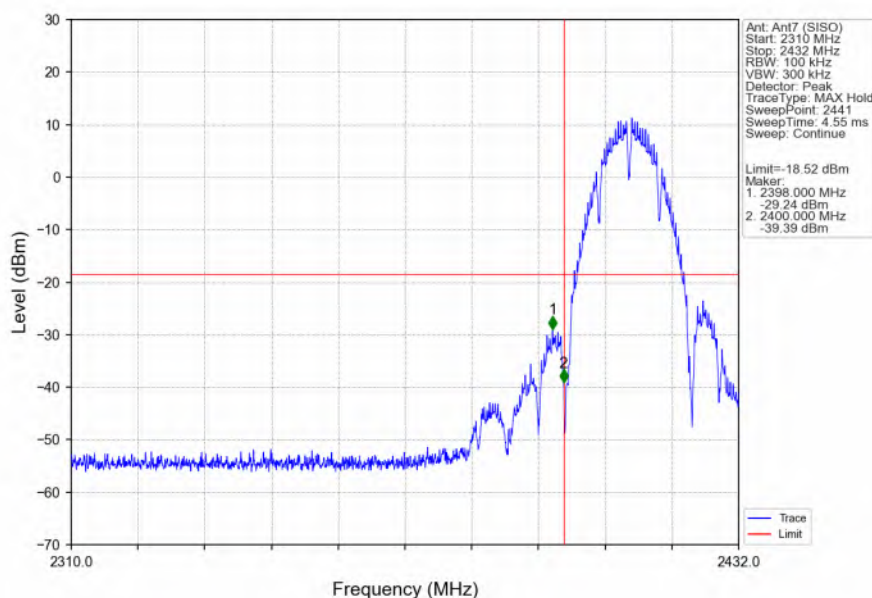
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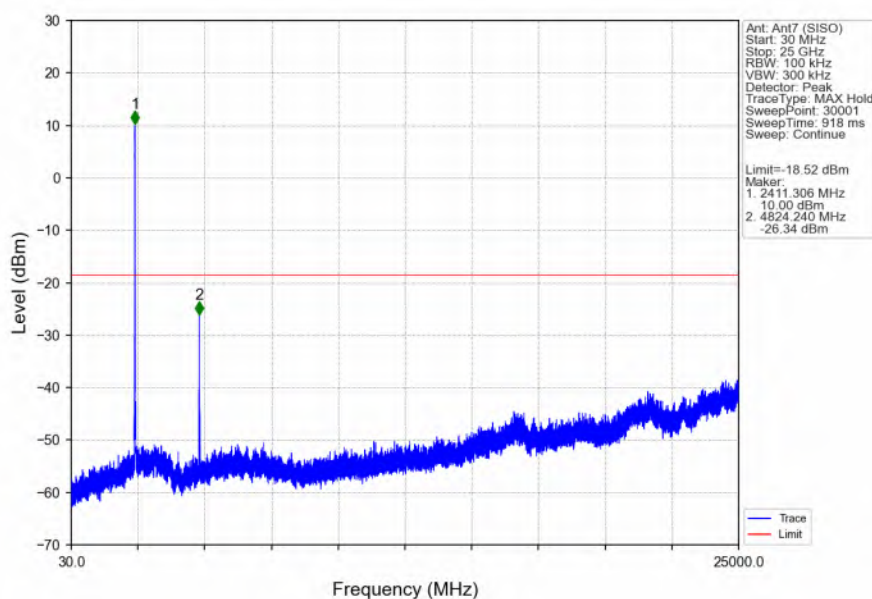
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5.2.2 CSE

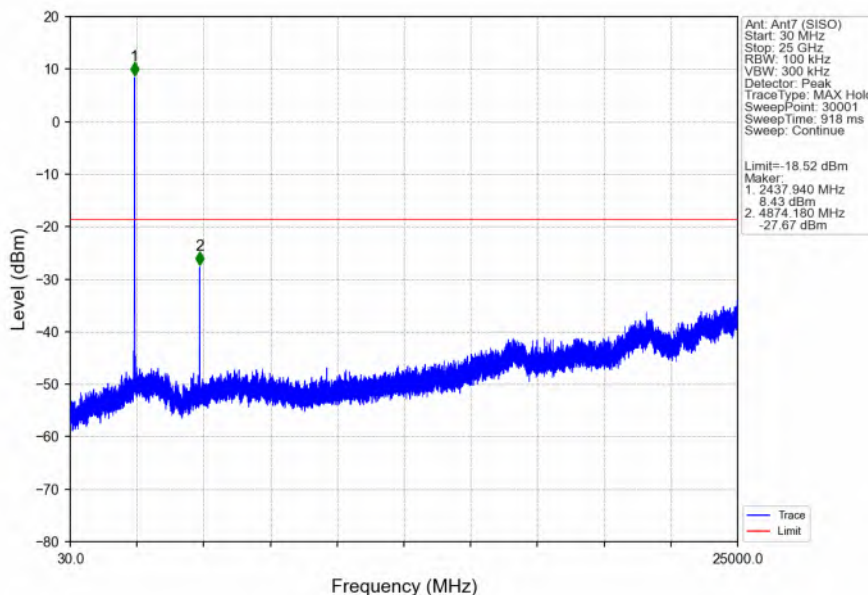
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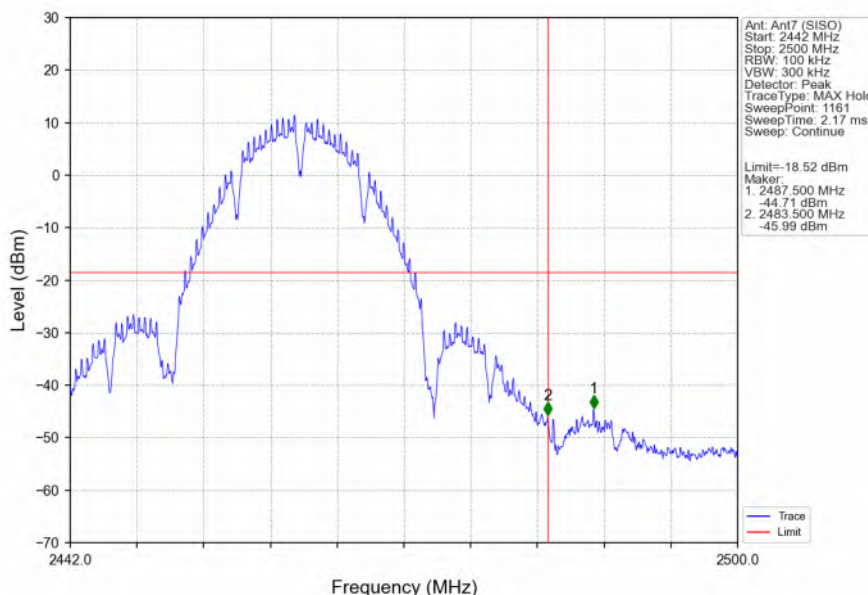
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802.11b_MCH_2437MHz_Ant7 (SISO)_NTNV



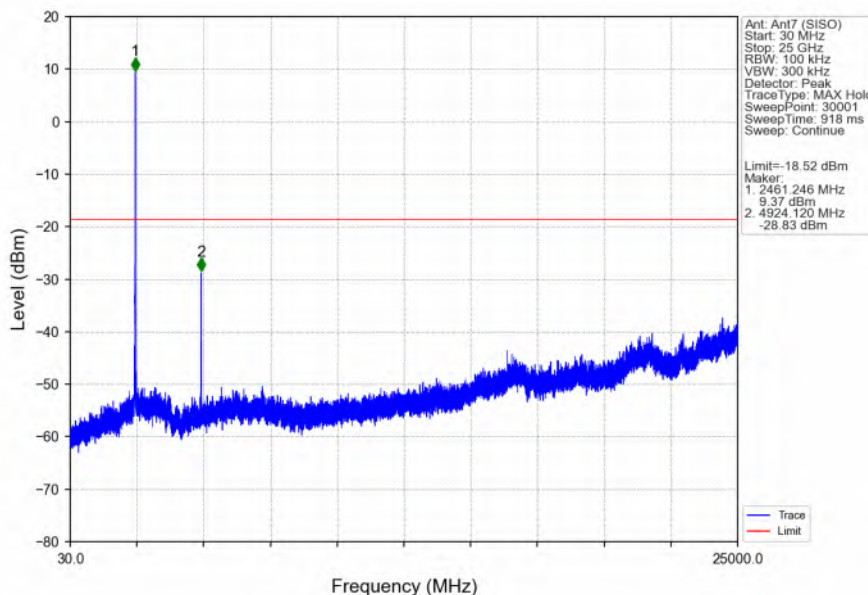
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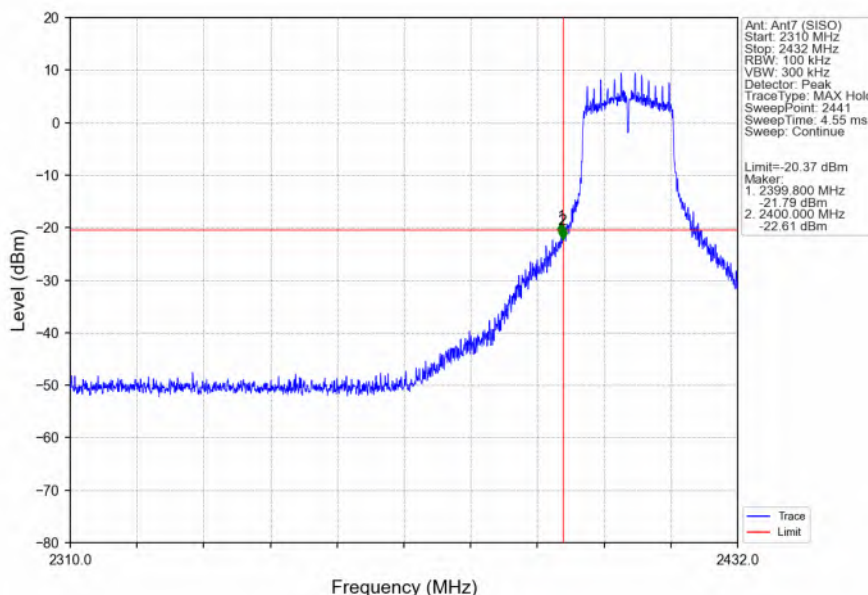
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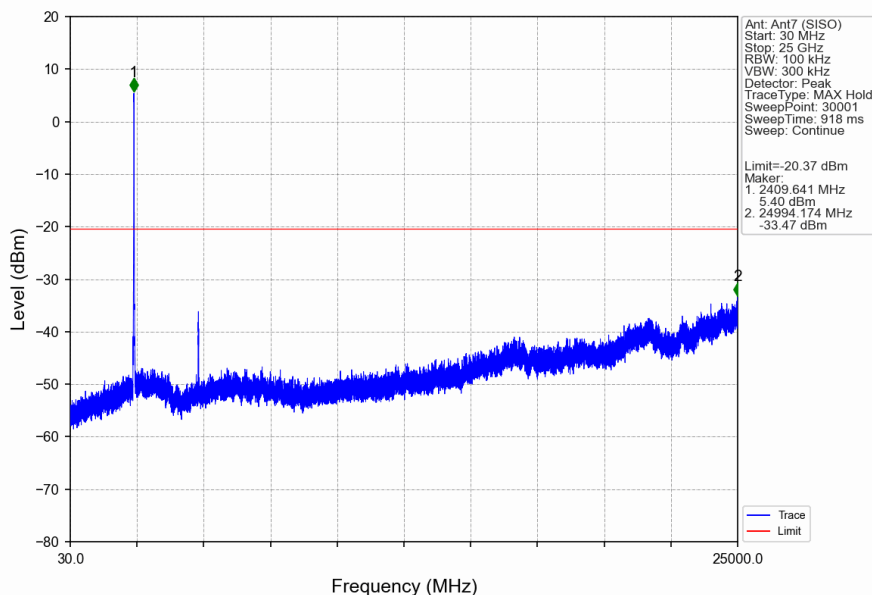
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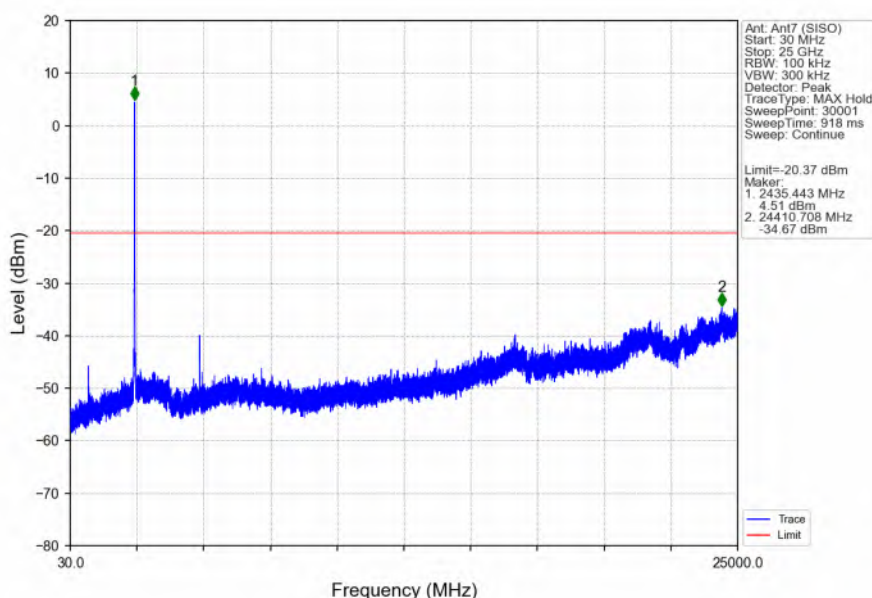
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802.11g_LCH_2412MHz_Ant7 (SISO)_NTNV



802.11g_MCH_2437MHz_Ant7 (SISO)_NTNV



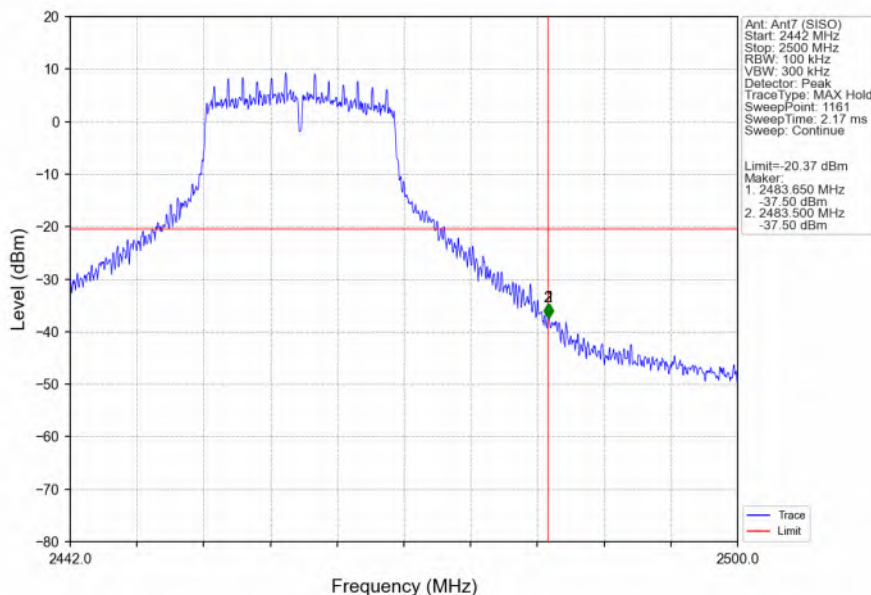
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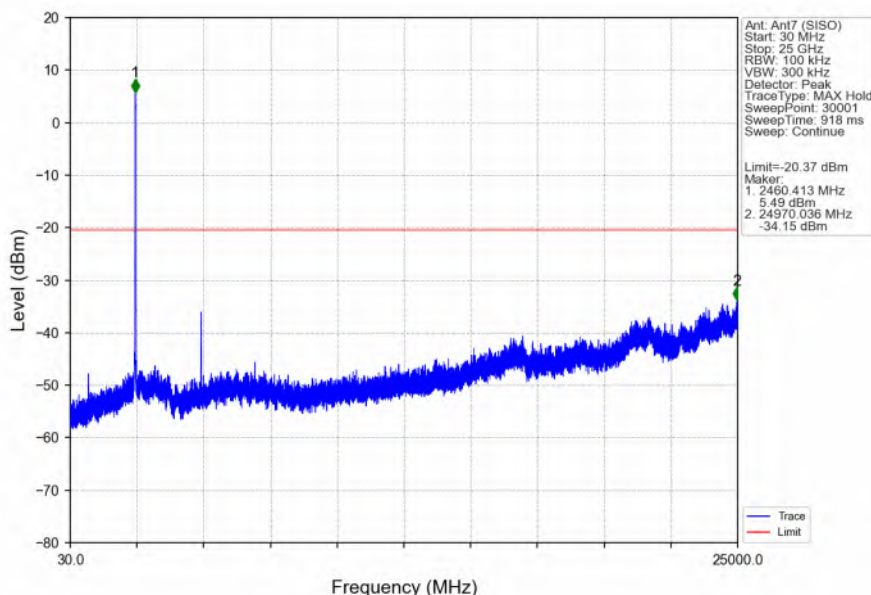
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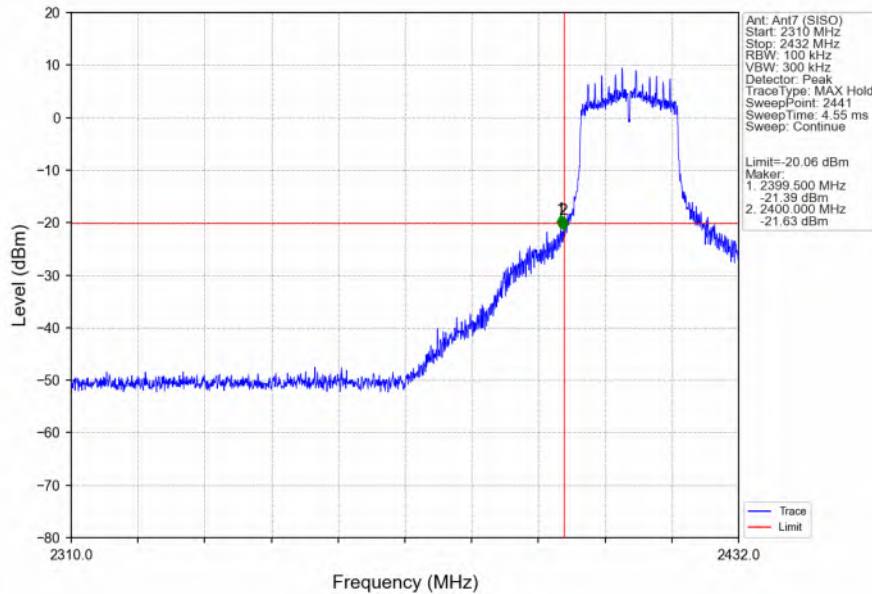
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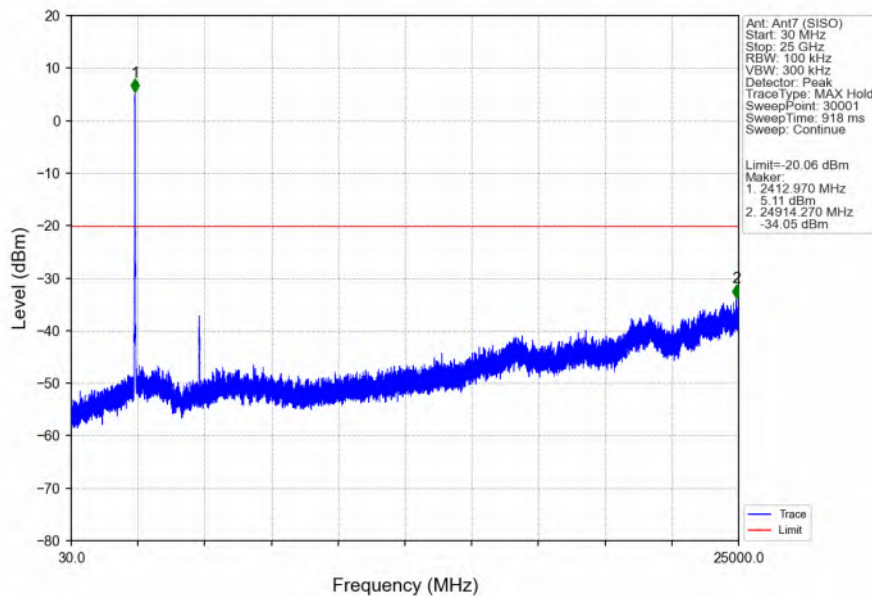
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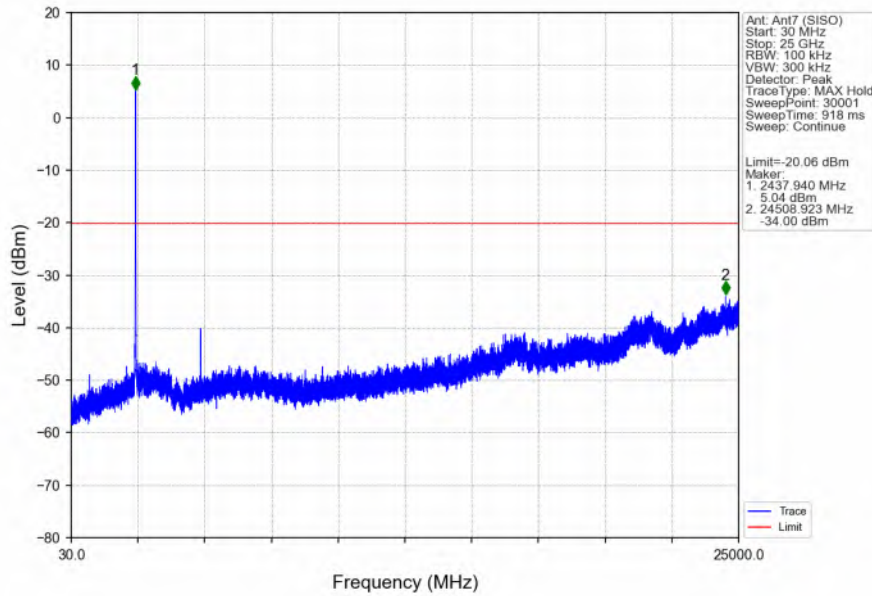
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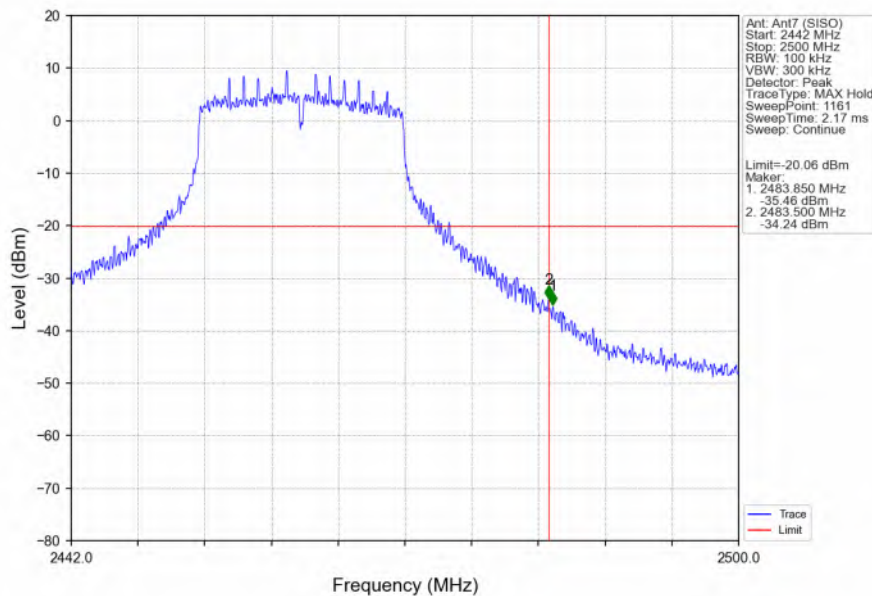
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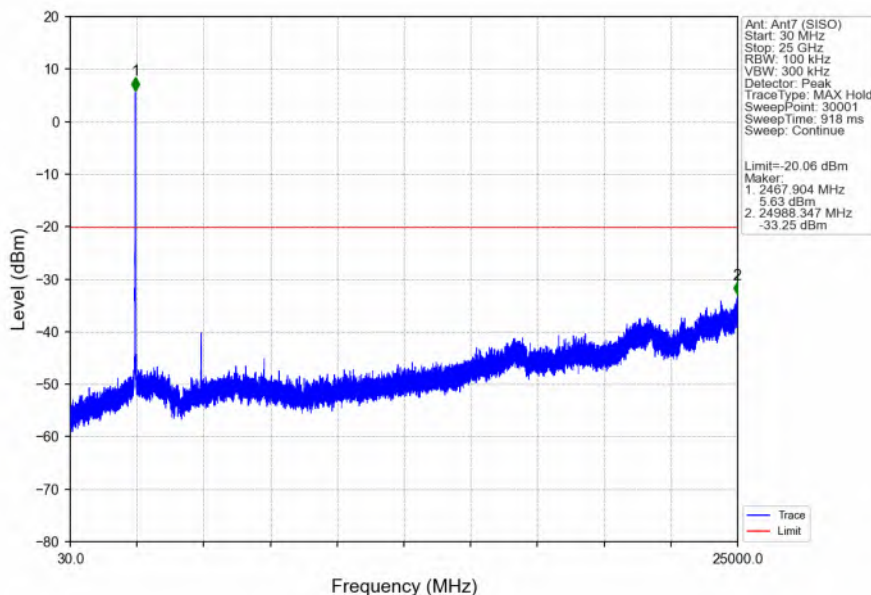
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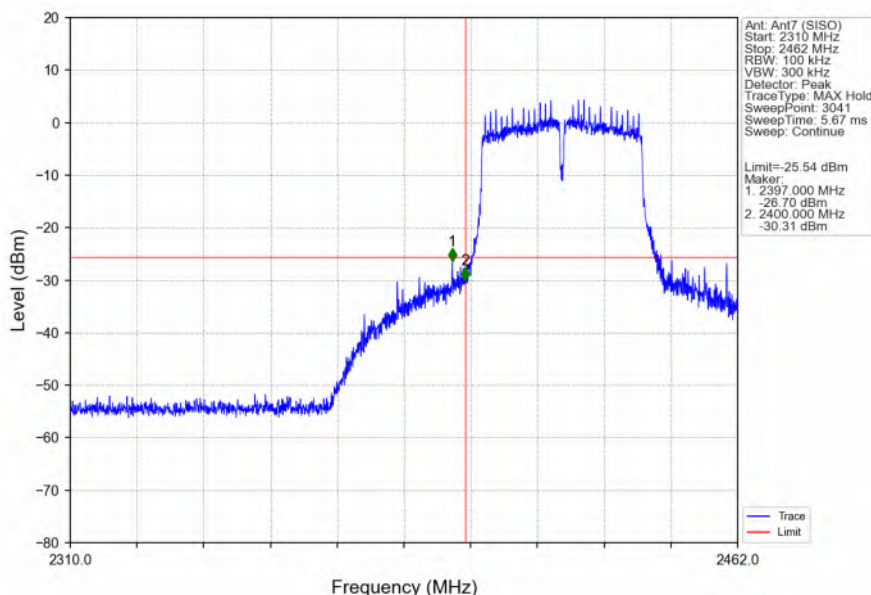
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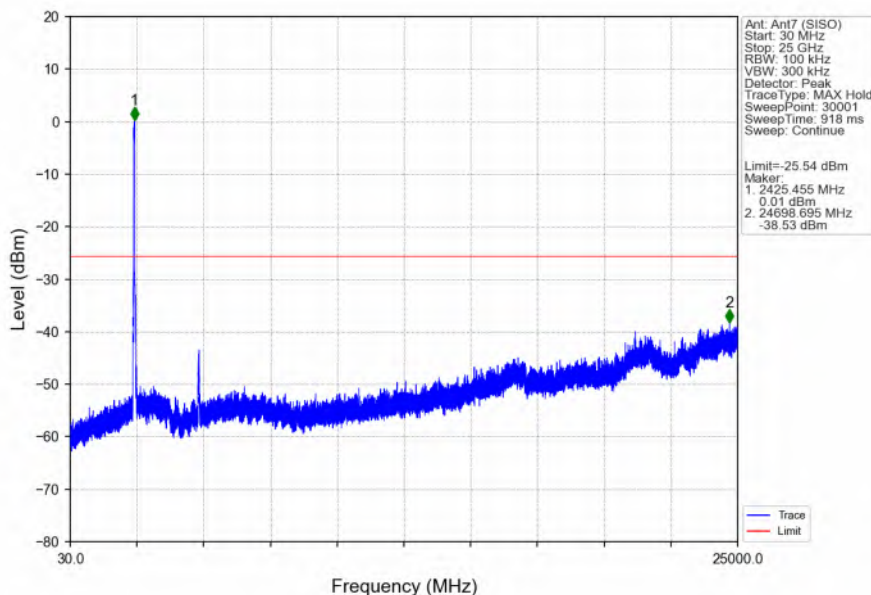
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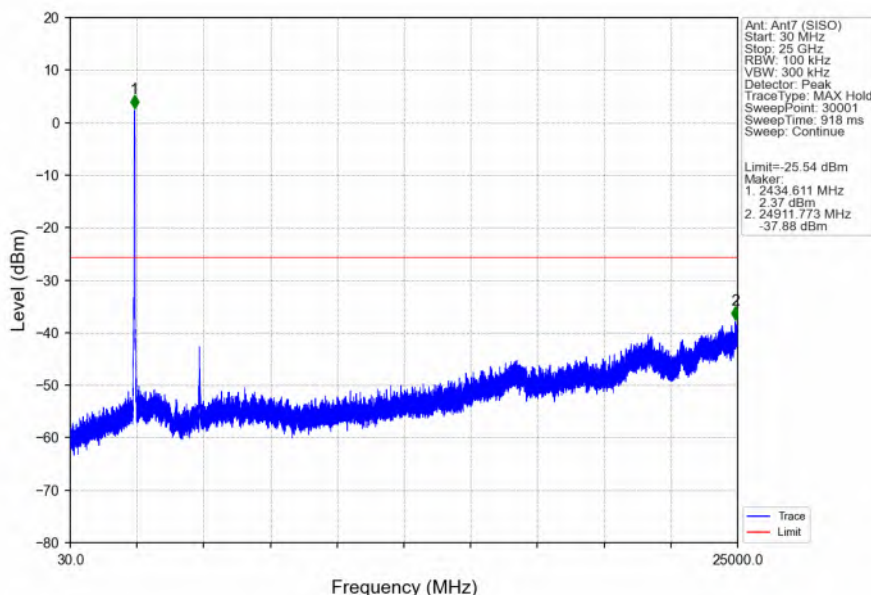
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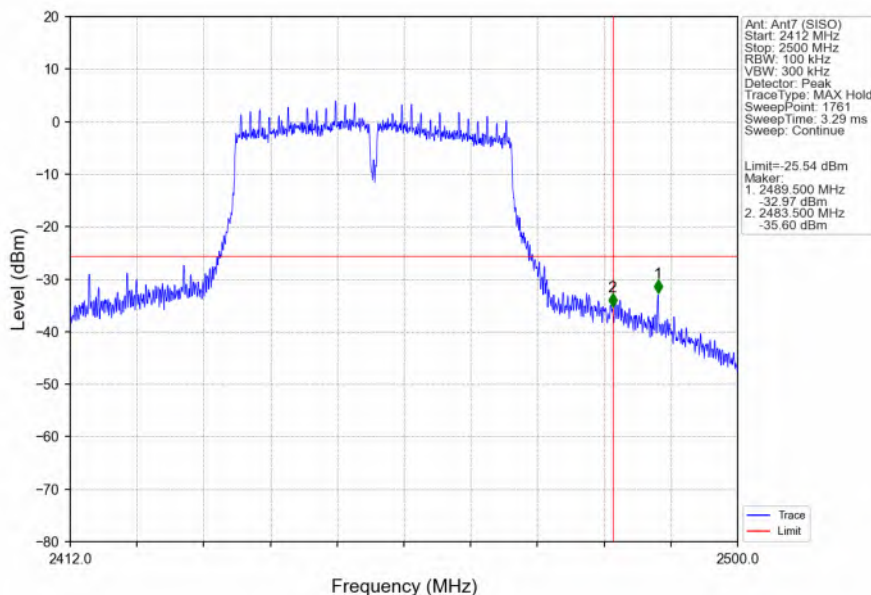
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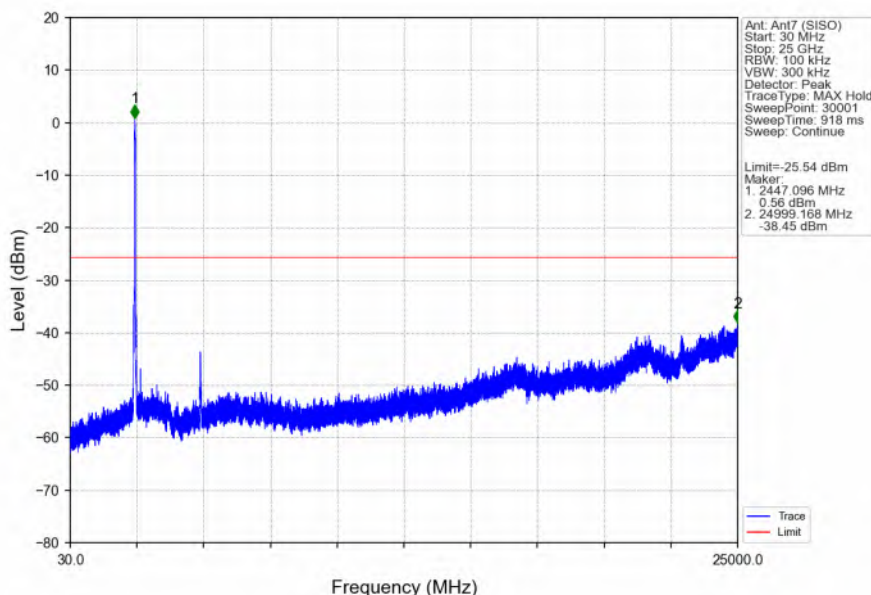
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802.11n(HT40)_HCH_2452MHz_Ant7 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant7 (SISO)_NTNV



- End of the Report -