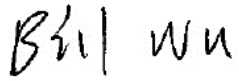
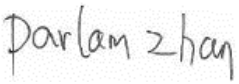
TEST REPORT

Application No.:	SHCR2501000043HS
FCC ID:	2BFI4AL550
Applicant:	Shanghai MediWorks Precision Instruments CO., Ltd.
Address of Applicant:	No.7, Ming Pu Phase 2, No. 3279 San Lu Road, Min Hang District, 20110, Shanghai, China
Manufacturer:	Shanghai MediWorks Precision Instruments CO., Ltd.
Address of Manufacturer:	No.7, Ming Pu Phase 2, No. 3279 San Lu Road, Min Hang District, 20110, Shanghai, China
Factory:	Shanghai MediWorks Precision Instruments CO., Ltd.
Address of Factory:	No.7, Ming Pu Phase 2, No. 3279 San Lu Road, Min Hang District, 20110, Shanghai, China
Equipment Under Test (EUT):	
EUT Name:	Optical Biometer
Model No.:	AL550, AL551, AL552
Trade Mark:	MediWorks
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2025-01-07
Date of Test:	2025-01-13 to 2025-01-22
Date of Issue:	2025-01-22
Test Result:	**Pass***

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

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2025-01-22	/

Authorized for issue by:				
Tested By		 **Bill Wu/Project Engineer**		
Approved By		 **Parlam Zhan / Reviewer**		

2 Test Summary

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

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Conducted Average Power		ANSI C63.10 (2013) Section 11.9.2	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.3	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass

Note: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only difference is AL551 and AL552 have fewer software functions compared to AL550, Consider the difference only the model AL550 was tested.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	AC 100-240V,50/60Hz
Test Voltage:	AC 120V 60Hz
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	Antenna 1: PIFA Antenna Antenna 2: PIFA Antenna
Antenna Gain:	Antenna 1: 3.29 dBi Antenna 1: 3.29 dBi (Provided by manufacturer) Directional gain: 6.30dBi
Date Rate:	802.11b:1/2/5.5./11Mbps 802.11g:6/9/12/18/24/36/48/54Mbps 802.11n:MCS0-MCS7

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	LENOVO	L460	-

4.3 Power level setting using in test

Channel	802.11b		802.11g		802.11n(HT20)	
	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2
1	54	53	56	55	48	47
6	54	53	56	55	48	47
11	54	53	56	55	48	47

Channel	802.11n(HT40)	
	Ant1	Ant2
3	49	49
6	49	49
9	49	49

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty cycle	0.4%
4	Occupied Bandwidth	3%
5	RF conducted power	0.6dB
6	RF power density	2.9dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
10	Temperature test	1°C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

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

4.5 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678
No tests were sub-contracted.
Note:
1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).
3. Sample source: sent by customer.

4.6 Test Facility

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

• A2LA (Certificate No. 6332.01)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• FCC (Designation Number: CN1301)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• ISED (CAB Identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2024/12/18	2025-12-17
Spectrum Analyzer	Keysight	N9020B	SHEM241-1	2024/12/18	2025-12-17
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2024-07-31	2025-07-30
Signal Generator	R&S	SMR20	SHEM006-1	2024-07-31	2025-07-30
Signal Generator	Agilent	N5182A	SHEM182-1	2024-07-31	2025-07-30
Communication Tester	R&S	CMW270	SHEM183-1	2024-05-23	2025-05-22
Communication Tester	R&S	CMW500	SHEM268-1	2024-05-23	2025-05-22
Power Sensor	Keysight	U2021XA * 4	SHEM293-1	2024-07-31	2025-07-30
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2024-11-05	2026-11-04
AC Power Stabilizer	APC	KDF-31020T-V0-F0	SHEM216-1	2024/12/18	2025-12-17
DC Power Supply	HP	6010A	SHEM222-1	2024/12/18	2025-12-17
Conducted test Cable	/	RF01~RF04	/	2024/12/18	2025-12-17
Switcher	Tonscend	JS0806	SHEM293-1	2024-07-31	2025-07-30
Test software	Tonscend	JS Tonscend BT/WIFI System	Version: 2.6	/	/
Switcher+Power Sensor	TST	TSPS2023R	SHEM263-1	2024-07-31	2025-07-30
Test software	TST	TST PASS	Version: 2.0	/	/
RF Radiated Test					
EMI test Receiver	R&S	ESU40	SHEM051-1	2024/12/18	2025-12-17
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2024/12/18	2025-12-17
Communication Tester	R&S	CMW500	SHEM268-1	2024-05-23	2025-05-22
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2024/12/18	2025-12-17
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2023-09-03	2025-09-02
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2023-04-17	2025-04-16
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2024-08-05	2026-08-04
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2023-09-03	2025-09-02
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2023-09-03	2025-09-02
Pre-Amplifier	HP	8447D	SHEM236-1	2024/12/18	2025-12-17
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2024/12/18	2025-12-17
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2023-05-06	2026-05-05
RE test Cable	/	PT18-NMNM-10M	SHEM217-2	2024/12/18	2025-12-17
Test software	ESE	E3	Version: 6.111221a	/	/

Conducted Emissions at AC Power Port					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2024/12/18	2025/12/17
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2024/12/18	2025/12/17
Line impedance stabilization network	EMCO	3816_2	SHEM019-1	2024/12/18	2025/12/17
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2024/12/18	2025/12/17
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2023/12/19	2026/12/18
CE test Cable	/	/	SHEM172-2	2024/12/18	2025/12/17
Test Software	ESE	e3	Version: 6.191211	N/A	N/A

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

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

6.1.2 Conclusion

Standard Requirement:

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

15.247(b) (4) requirement:

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

EUT Antenna:

The antenna 1 and Antenna 2 is PIFA antenna and no consideration of replacement. The best case gain of the antenna 1 is 3.29 dBi and antenna 2 is 3.29 dBi. The directional gain is 6.30dBi.

Antenna location: Refer to internal photo.

7 Radio Spectrum Matter Test Results

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

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

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency.		
Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz		

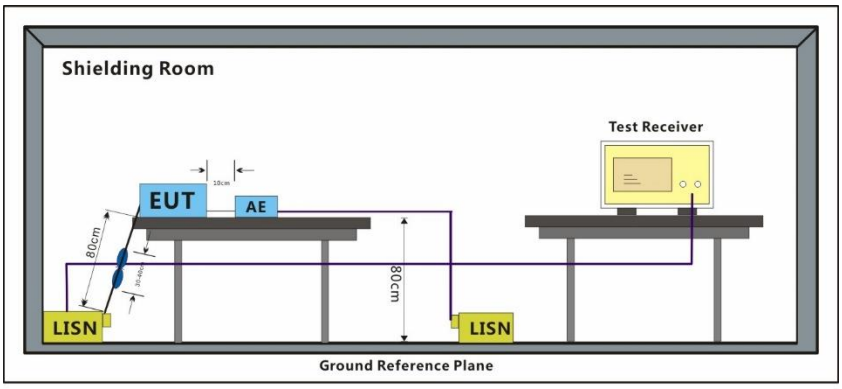
7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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.

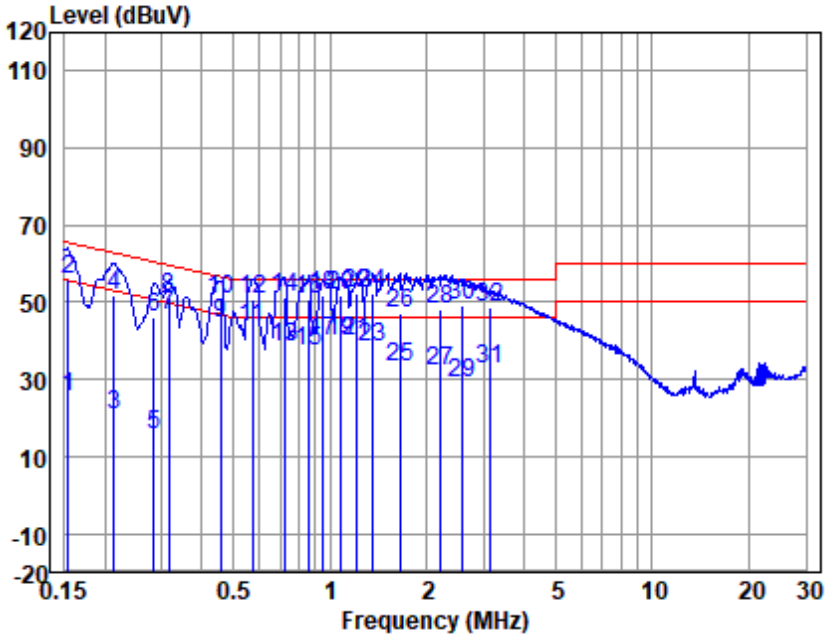
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

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: 00; Line: Live line



LISN : LINE
EUT/Project No : 0043HS
Test Mode : 00

	Freq	Read level	LISN Factor	Cable Loss	Emission Level	Limit	Over Limit	Remark
	(MHz)	(dBuV)	(dB)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.15	15.09	0.50	9.90	25.49	55.78	-30.29	Average
2	0.15	45.68	0.50	9.90	56.08	65.78	-9.70	QP
3	0.21	10.50	0.48	9.90	20.88	53.10	-32.22	Average
4	0.21	41.66	0.48	9.90	52.04	63.10	-11.06	QP
5	0.28	5.49	0.38	9.90	15.77	50.68	-34.91	Average
6	0.28	35.89	0.38	9.90	46.17	60.68	-14.51	QP
7	0.32	36.37	0.35	9.90	46.62	49.80	-3.18	Average
8	0.32	41.00	0.35	9.90	51.25	59.80	-8.55	QP
9	0.46	34.28	0.23	9.90	44.41	46.76	-2.35	Average
10	0.46	40.59	0.23	9.90	50.72	56.76	-6.04	QP
11	0.57	33.22	0.20	9.90	43.32	46.00	-2.68	Average
12	0.57	40.71	0.20	9.90	50.81	56.00	-5.19	QP

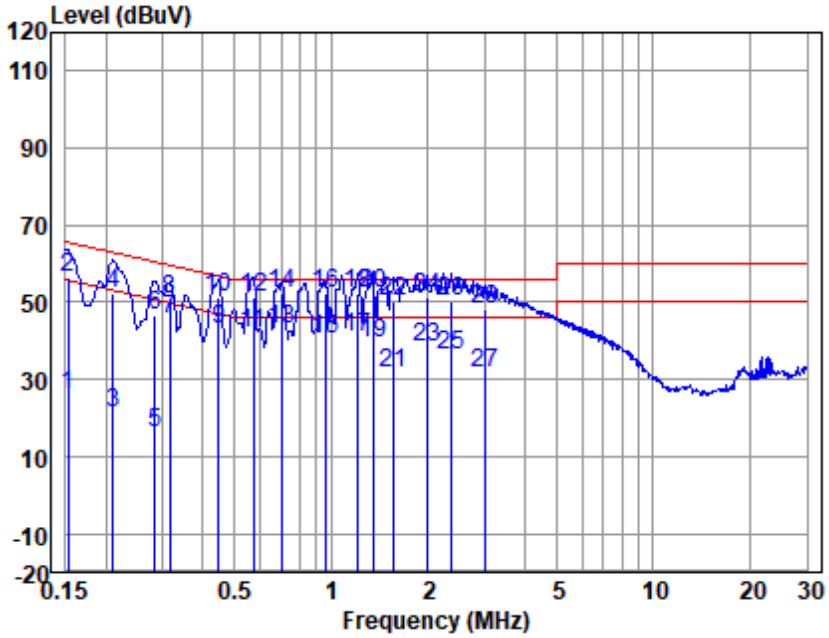
Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 00; Line: Live line

	Freq	Read level	LISN Factor	Cable Loss	Emission Level	Limit	Over Limit	Remark
	(MHz)	(dBuV)	(dB)	(dB)	(dBuV)	(dBuV)	(dB)	
13	0.72	28.25	0.20	9.91	38.36	46.00	-7.64	Average
14	0.72	41.43	0.20	9.91	51.54	56.00	-4.46	QP
15	0.86	27.01	0.20	9.96	37.17	46.00	-8.83	Average
16	0.86	40.53	0.20	9.96	50.69	56.00	-5.31	QP
17	0.95	29.70	0.20	9.98	39.88	46.00	-6.12	Average
18	0.95	41.53	0.20	9.98	51.71	56.00	-4.29	QP
19	1.08	29.82	0.20	10.01	40.03	46.00	-5.97	Average
20	1.08	41.76	0.20	10.01	51.97	56.00	-4.03	QP
21	1.22	29.82	0.20	10.03	40.05	46.00	-5.95	Average
22	1.22	42.13	0.20	10.03	52.36	56.00	-3.64	QP
23	1.36	28.12	0.20	10.04	38.36	46.00	-7.64	Average
24	1.36	41.94	0.20	10.04	52.18	56.00	-3.82	QP
25	1.64	23.02	0.20	10.07	33.29	46.00	-12.71	Average
26	1.64	36.92	0.20	10.07	47.19	56.00	-8.81	QP
27	2.19	21.67	0.21	10.11	31.99	46.00	-14.01	Average
28	2.19	37.86	0.21	10.11	48.18	56.00	-7.82	QP
29	2.57	18.90	0.23	10.13	29.26	46.00	-16.74	Average
30	2.57	38.80	0.23	10.13	49.16	56.00	-6.84	QP
31	3.16	22.37	0.25	10.15	32.77	46.00	-13.23	Average
32	3.16	38.19	0.25	10.15	48.59	56.00	-7.41	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 00; Line: Neutral Line



LISN : NEUTRAL
EUT/Project No : 0043HS
Test Mode : 00

	Freq	Read level	LISN Factor	Cable Loss	Emission Level	Limit	Over Limit	Remark
	(MHz)	(dBuV)	(dB)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.15	15.85	0.34	9.90	26.09	55.87	-29.78	Average
2	0.15	46.29	0.34	9.90	56.53	65.87	-9.34	QP
3	0.21	11.12	0.30	9.90	21.32	53.18	-31.86	Average
4	0.21	42.04	0.30	9.90	52.24	63.18	-10.94	QP
5	0.28	5.97	0.30	9.90	16.17	50.72	-34.55	Average
6	0.28	36.54	0.30	9.90	46.74	60.72	-13.98	QP
7	0.32	35.40	0.30	9.90	45.60	49.80	-4.20	Average
8	0.32	40.80	0.30	9.90	51.00	59.80	-8.80	QP
9	0.45	33.02	0.30	9.90	43.22	46.93	-3.71	Average
10	0.45	40.88	0.30	9.90	51.08	56.93	-5.85	QP
11	0.57	32.03	0.30	9.90	42.23	46.00	-3.77	Average
12	0.57	40.93	0.30	9.90	51.13	56.00	-4.87	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 00; Line: Neutral Line

	Freq	Read level	LISN Factor	Cable Loss	Emission Level	Limit	Over Limit	Remark
	(MHz)	(dBuV)	(dB)	(dB)	(dBuV)	(dBuV)	(dB)	
13	0.70	32.86	0.30	9.90	43.06	46.00	-2.94	Average
14	0.70	42.06	0.30	9.90	52.26	56.00	-3.74	QP
15	0.96	30.04	0.30	9.99	40.33	46.00	-5.67	Average
16	0.96	41.99	0.30	9.99	52.28	56.00	-3.72	QP
17	1.21	30.53	0.30	10.03	40.86	46.00	-5.14	Average
18	1.21	41.87	0.30	10.03	52.20	56.00	-3.80	QP
19	1.35	29.23	0.30	10.04	39.57	46.00	-6.43	Average
20	1.35	41.86	0.30	10.04	52.20	56.00	-3.80	QP
21	1.57	21.46	0.30	10.06	31.82	46.00	-14.18	Average
22	1.57	39.77	0.30	10.06	50.13	56.00	-5.87	QP
23	1.98	27.95	0.30	10.10	38.35	46.00	-7.65	Average
24	1.98	40.89	0.30	10.10	51.29	56.00	-4.71	QP
25	2.35	25.70	0.34	10.12	36.16	46.00	-9.84	Average
26	2.35	39.70	0.34	10.12	50.16	56.00	-5.84	QP
27	2.99	20.93	0.39	10.14	31.46	46.00	-14.54	Average
28	2.99	37.88	0.39	10.14	48.41	56.00	-7.59	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

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 (2013) Section 6.10.5
Measurement Distance: 3m

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.		

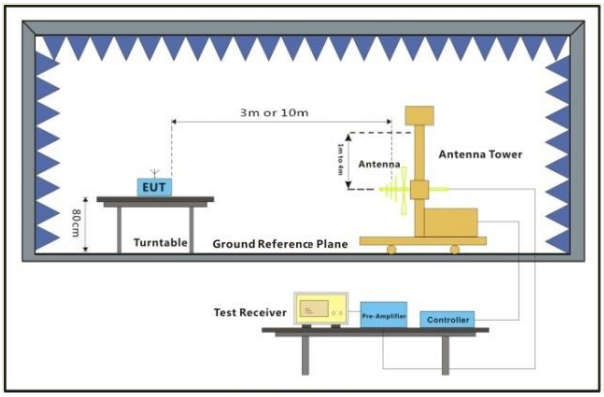
7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

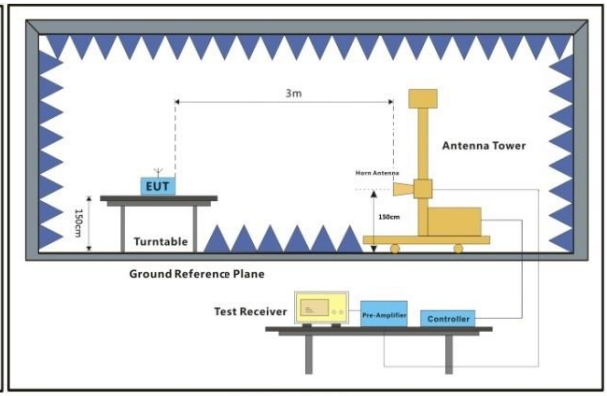
7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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

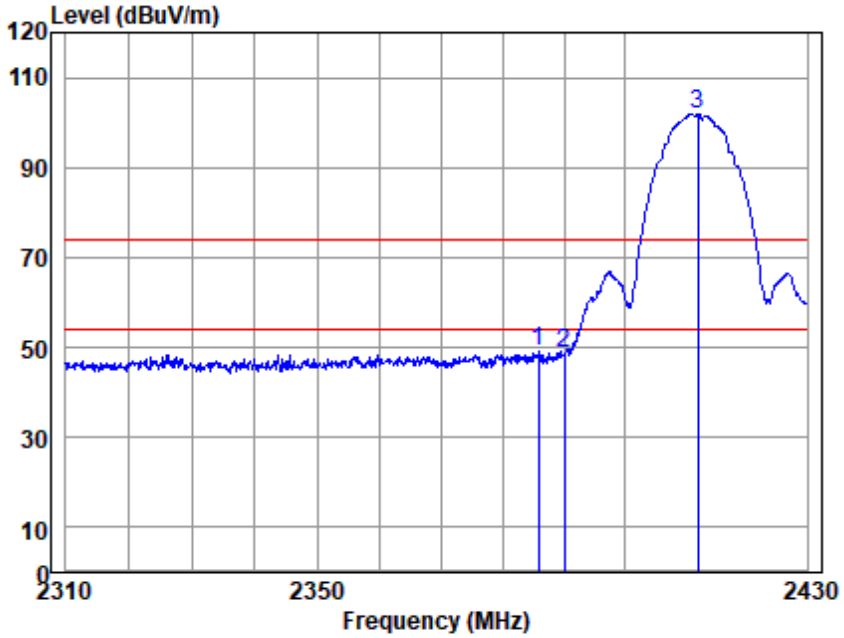
Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

Remark 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.

Remark 4:For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geqslant$1/T (Duty cycle$<$98%) or 10Hz (Duty cycle$\geqslant$98%) for Average detection (AV) at frequency above 1GHz.

Remark 5: This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for b/g modulation and MIMO antenna operation for n modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.

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

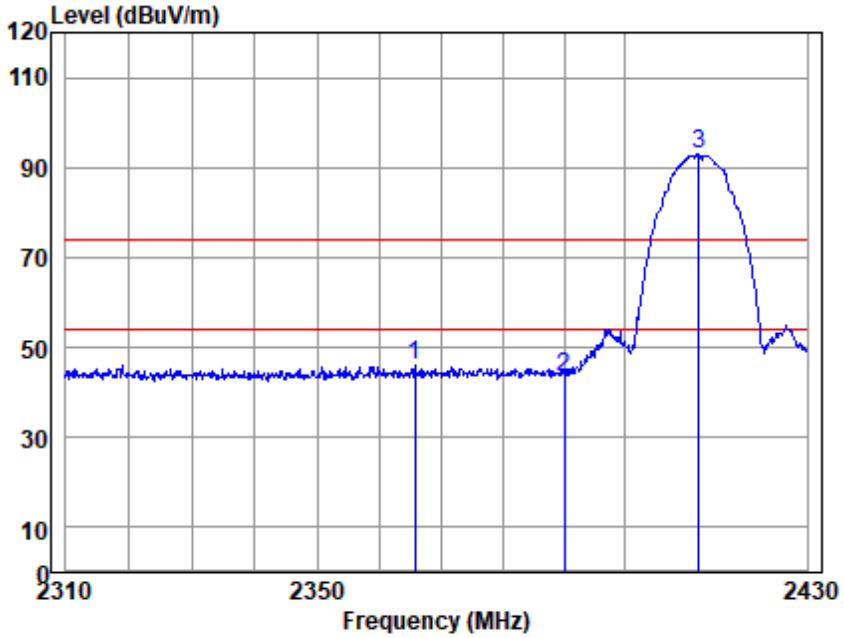


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2385.857	52.04	28.80	3.34	35.18	49.00	74.00	-25.00	Peak
2390.000	51.95	28.80	3.34	35.18	48.91	74.00	-25.09	Peak
2411.977	105.01	28.90	3.33	35.20	102.04	74.00	28.04	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

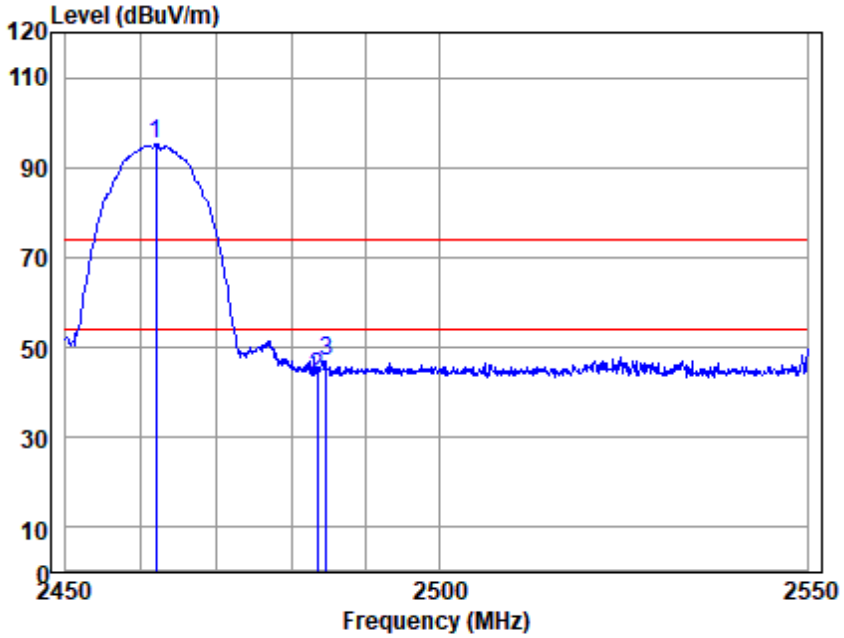


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2365.763	49.02	28.68	3.31	35.16	45.85	74.00	-28.15	Peak
2390.000	46.45	28.80	3.34	35.18	43.41	74.00	-30.59	Peak
2412.099	96.16	28.90	3.33	35.20	93.19	74.00	19.19	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

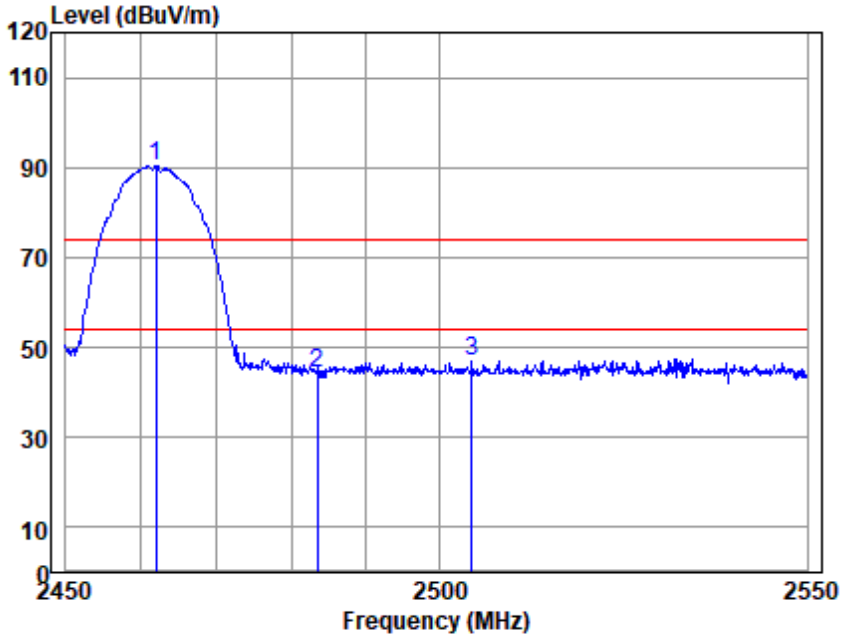


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2461.987	98.05	29.05	3.43	35.24	95.29	74.00	21.29	Peak
2483.500	46.12	29.09	3.36	35.26	43.31	74.00	-30.69	Peak
2484.645	49.91	29.09	3.36	35.26	47.10	74.00	-26.90	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

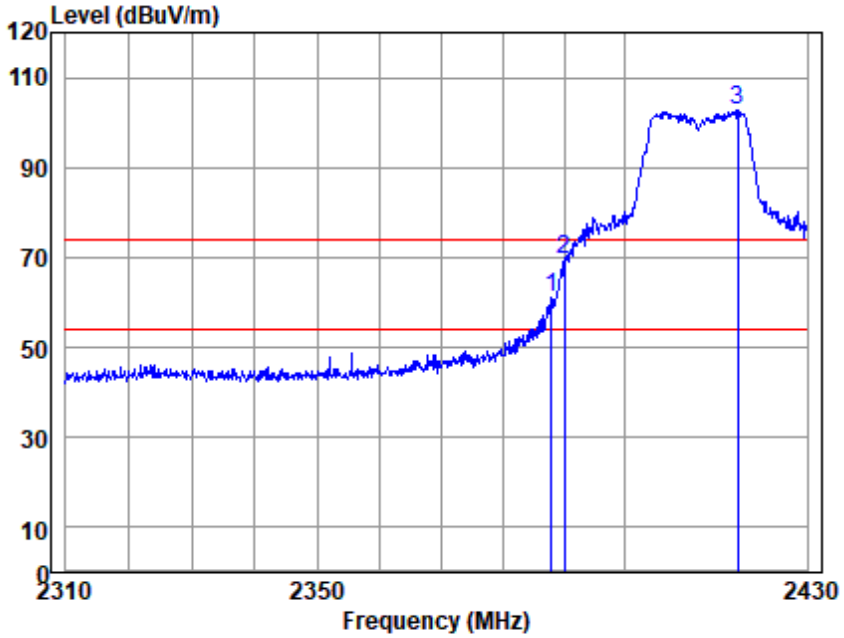


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2461.987	93.29	29.05	3.43	35.24	90.53	74.00	16.53	Peak
2483.500	47.21	29.09	3.36	35.26	44.40	74.00	-29.60	Peak
2504.304	49.58	29.13	3.39	35.28	46.82	74.00	-27.18	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

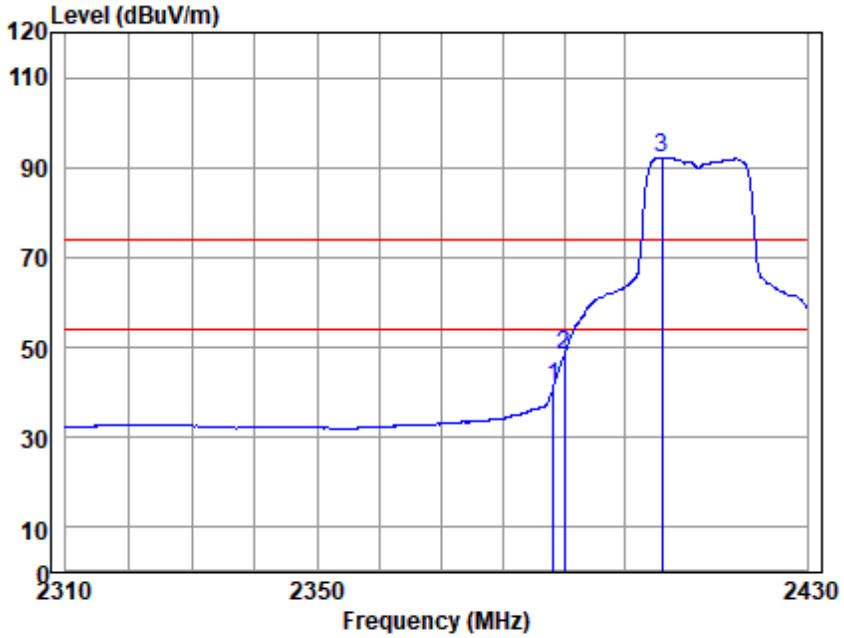


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2387.912	64.24	28.80	3.34	35.18	61.20	74.00	-12.80	Peak
2390.000	72.75	28.80	3.34	35.18	69.71	74.00	-4.29	Peak
2418.459	105.82	28.92	3.33	35.21	102.86	74.00	28.86	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

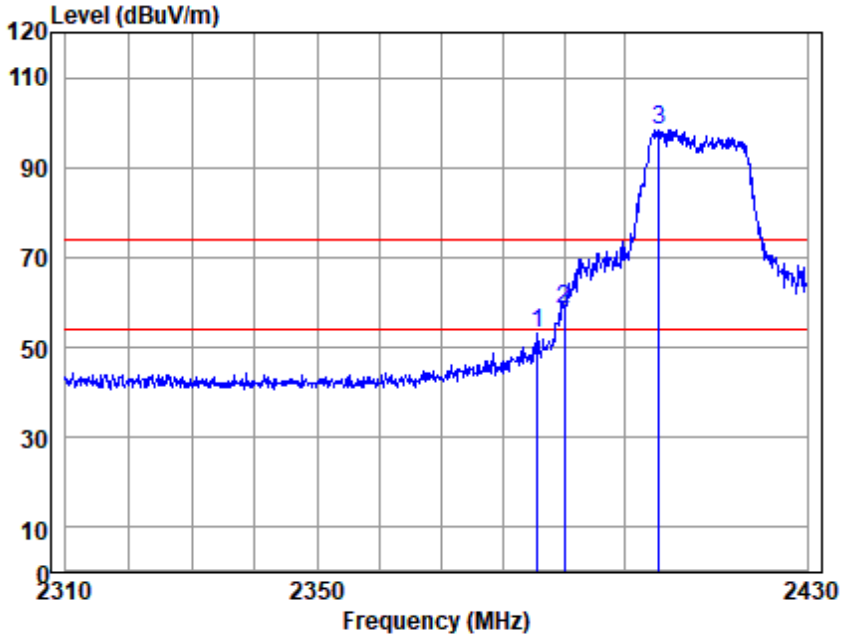


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2388.274	44.34	28.80	3.34	35.18	41.30	54.00	-12.70	Average
2390.000	51.41	28.80	3.34	35.18	48.37	54.00	-5.63	Average
2406.121	95.25	28.89	3.33	35.20	92.27	54.00	38.27	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

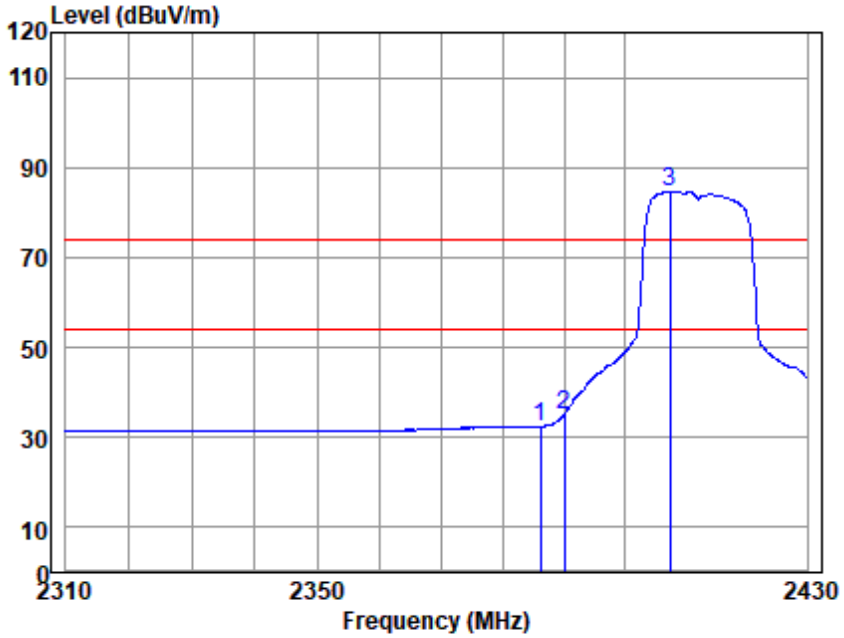


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2385.736	56.15	28.80	3.34	35.18	53.11	74.00	-20.89	Peak
2390.000	61.70	28.80	3.34	35.18	58.66	74.00	-15.34	Peak
2405.511	101.41	28.89	3.33	35.20	98.43	74.00	24.43	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

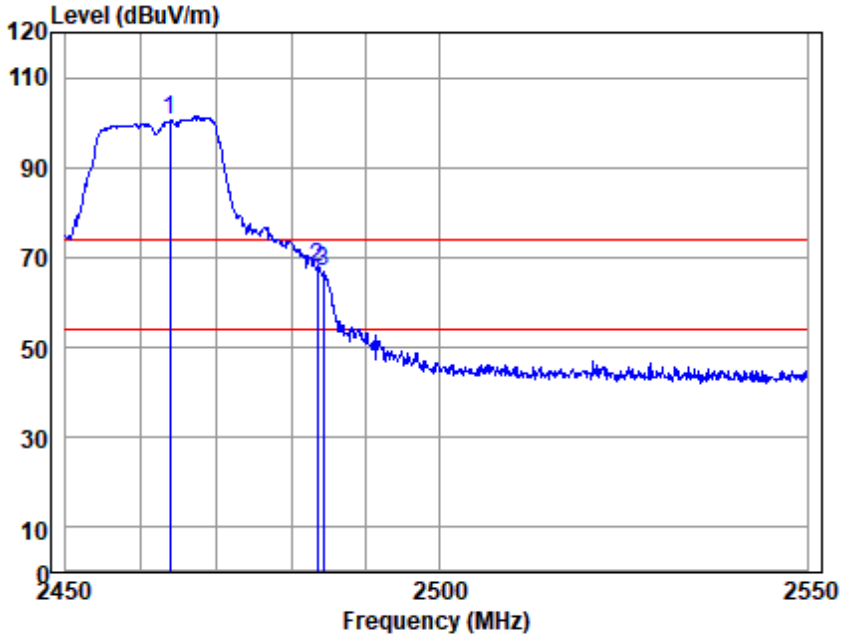


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2386.098	35.43	28.80	3.34	35.18	32.39	54.00	-21.61	Average
2390.000	38.10	28.80	3.34	35.18	35.06	54.00	-18.94	Average
2407.339	87.61	28.89	3.33	35.20	84.63	54.00	30.63	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

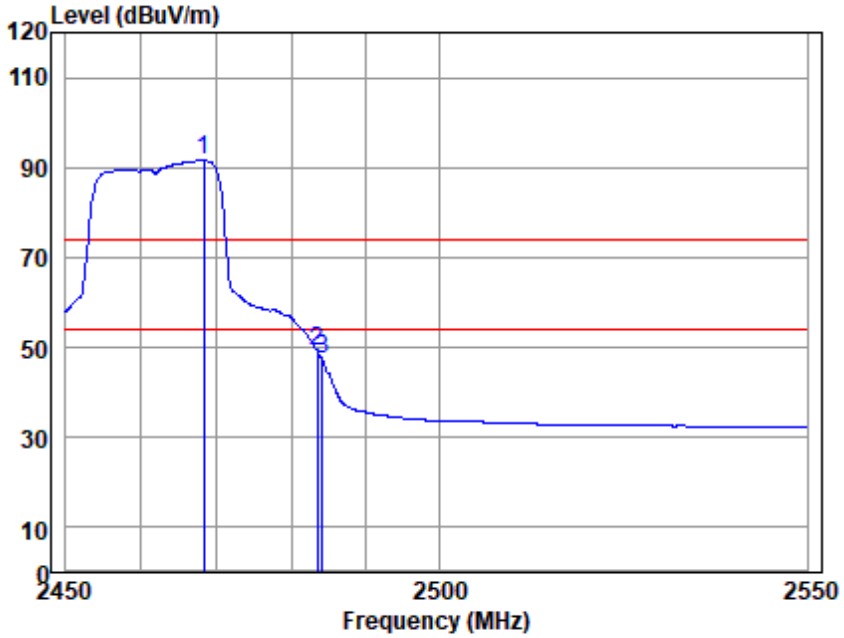


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2463.859	103.08	29.05	3.43	35.24	100.32	74.00	26.32	Peak
2483.500	70.60	29.09	3.36	35.26	67.79	74.00	-6.21	Peak
2484.347	69.76	29.09	3.36	35.26	66.95	74.00	-7.05	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

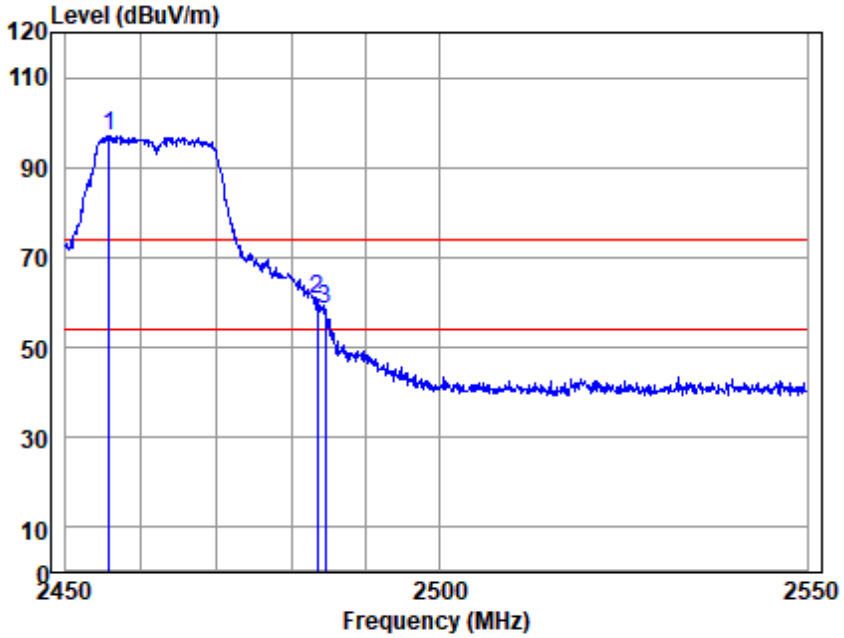


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2468.298	94.39	29.06	3.41	35.25	91.61	54.00	37.61	Average
2483.500	51.98	29.09	3.36	35.26	49.17	54.00	-4.83	Average
2484.148	50.09	29.09	3.36	35.26	47.28	54.00	-6.72	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

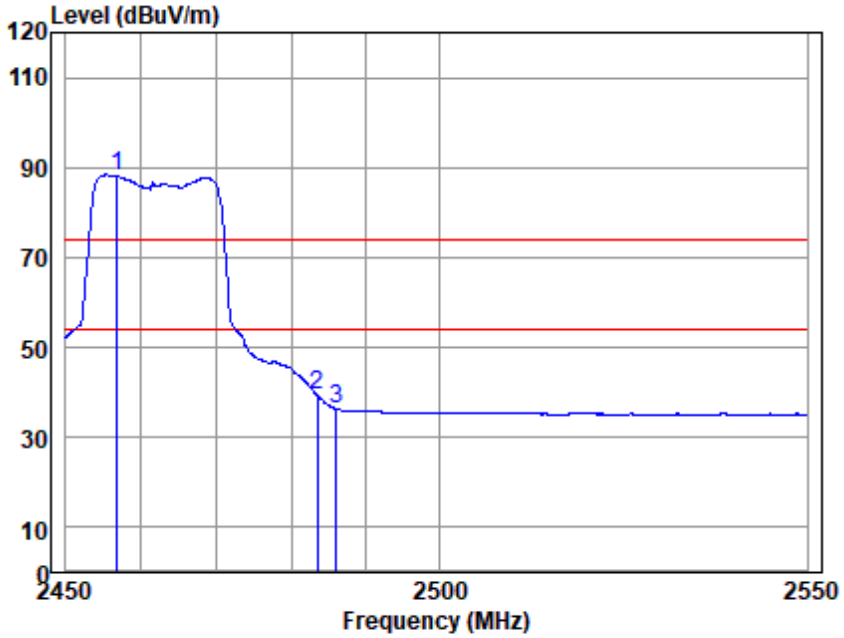


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2455.790	99.93	29.04	3.39	35.24	97.12	74.00	23.12	Peak
2483.500	63.69	29.09	3.36	35.26	60.88	74.00	-13.12	Peak
2484.546	61.22	29.09	3.36	35.26	58.41	74.00	-15.59	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

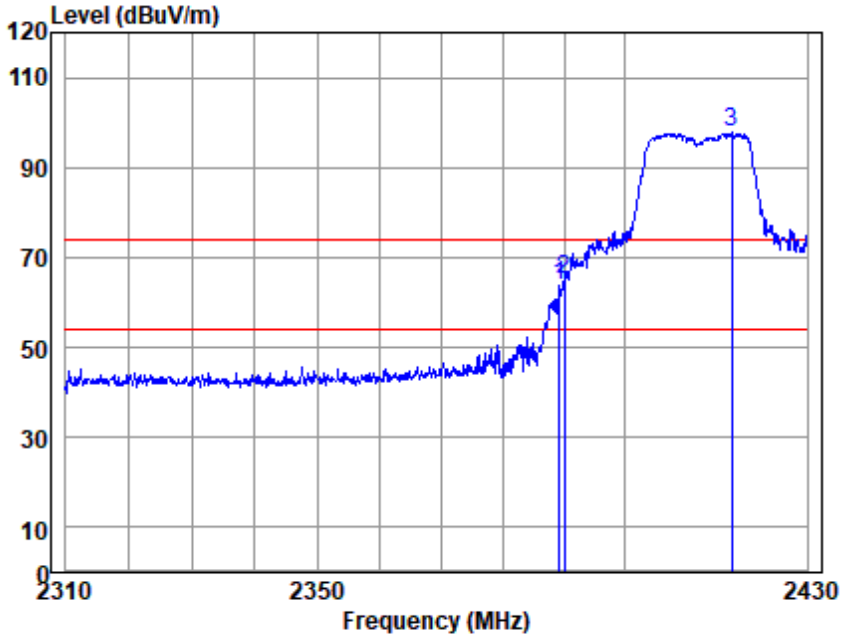


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2456.871	90.78	29.04	3.39	35.24	87.97	54.00	33.97	Average
2483.500	42.20	29.09	3.36	35.26	39.39	54.00	-14.61	Average
2486.037	39.16	29.09	3.36	35.26	36.35	54.00	-17.65	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

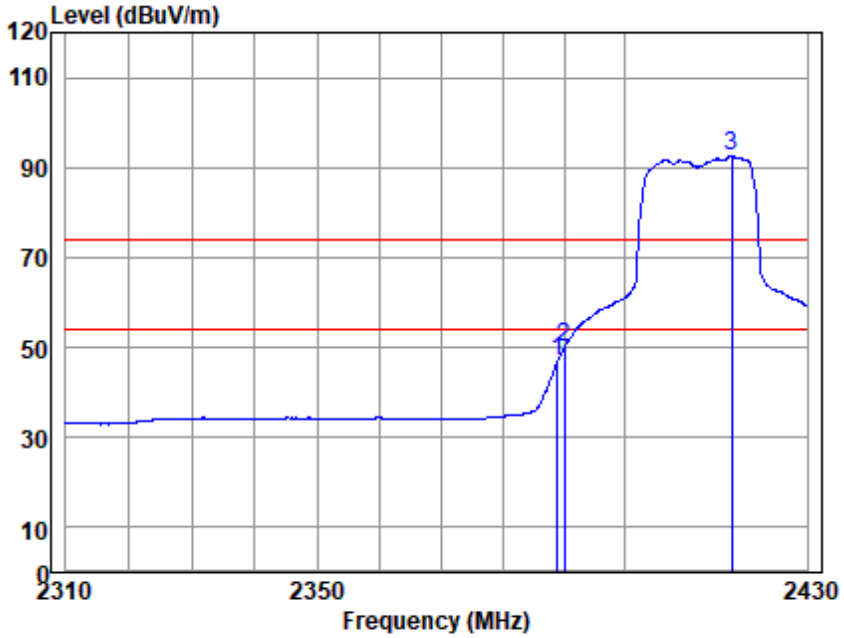


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2389.242	66.93	28.80	3.34	35.18	63.89	74.00	-10.11	Peak
2390.000	67.96	28.80	3.34	35.18	64.92	74.00	-9.08	Peak
2417.602	100.67	28.90	3.33	35.20	97.70	74.00	23.70	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

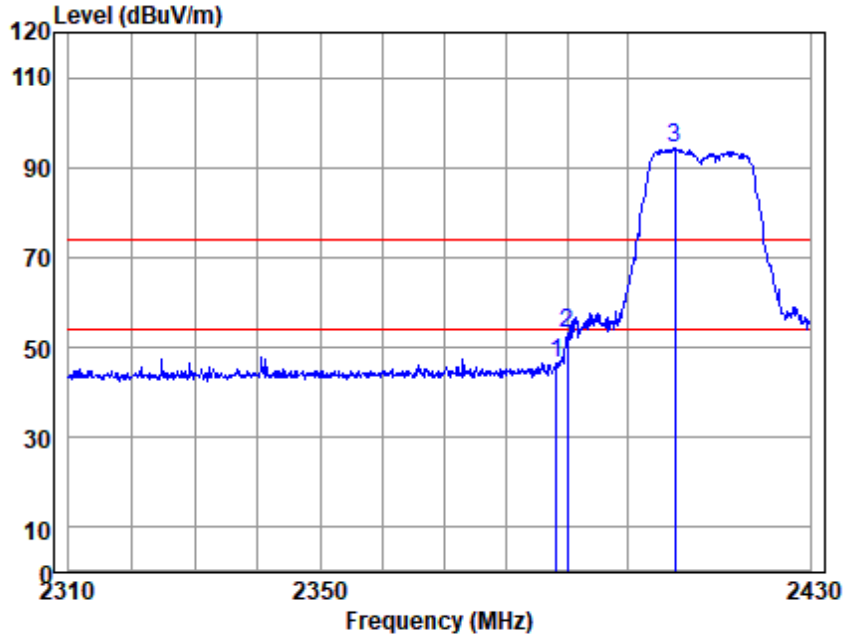


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2388.879	49.87	28.80	3.34	35.18	46.83	54.00	-7.17	Average
2390.000	52.88	28.80	3.34	35.18	49.84	54.00	-4.16	Average
2417.480	95.44	28.90	3.33	35.20	92.47	54.00	38.47	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

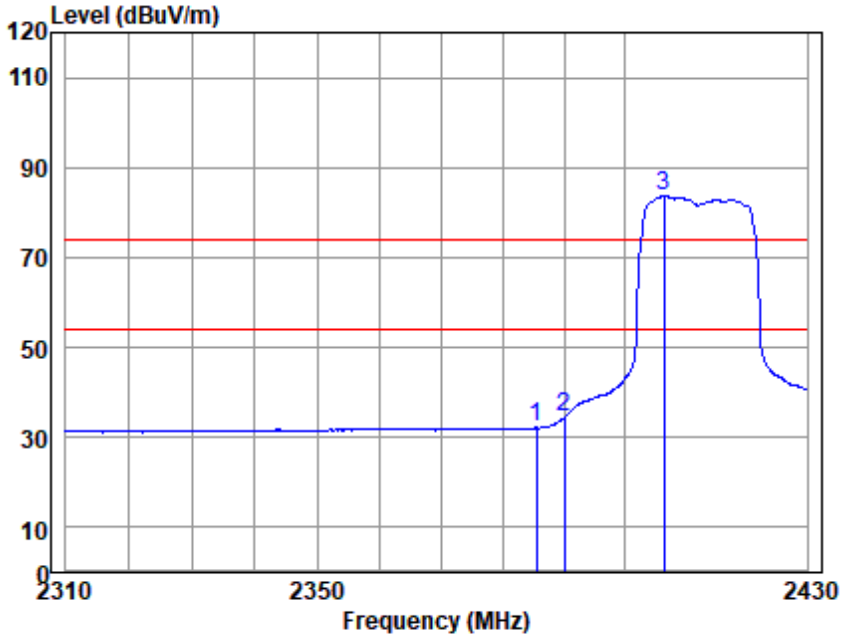


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2388.274	49.68	28.80	3.34	35.18	46.64	74.00	-27.36	Peak
2390.000	56.28	28.80	3.34	35.18	53.24	74.00	-20.76	Peak
2407.705	97.21	28.89	3.33	35.20	94.23	74.00	20.23	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

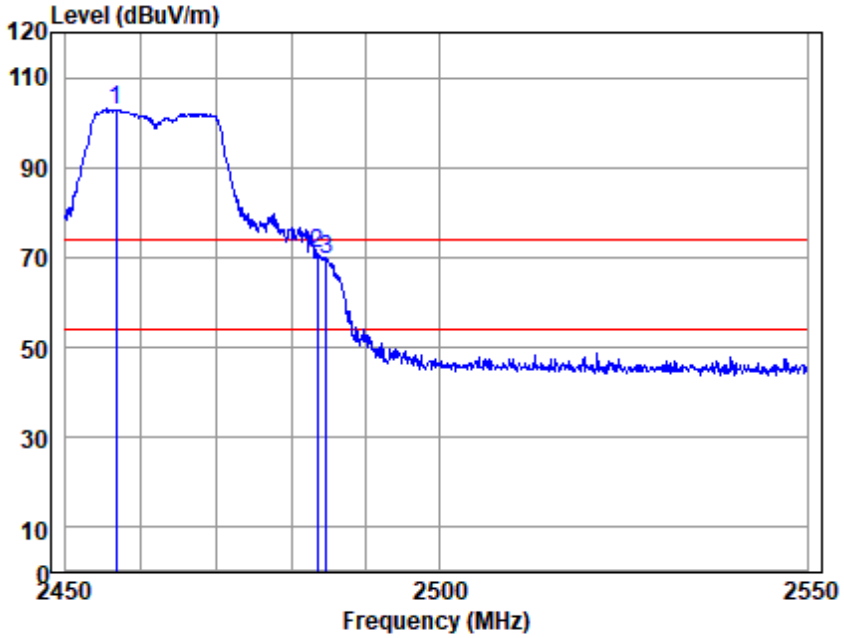


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2385.494	35.16	28.80	3.34	35.18	32.12	54.00	-21.88	Average
2390.000	37.53	28.80	3.34	35.18	34.49	54.00	-19.51	Average
2406.364	86.76	28.89	3.33	35.20	83.78	54.00	29.78	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

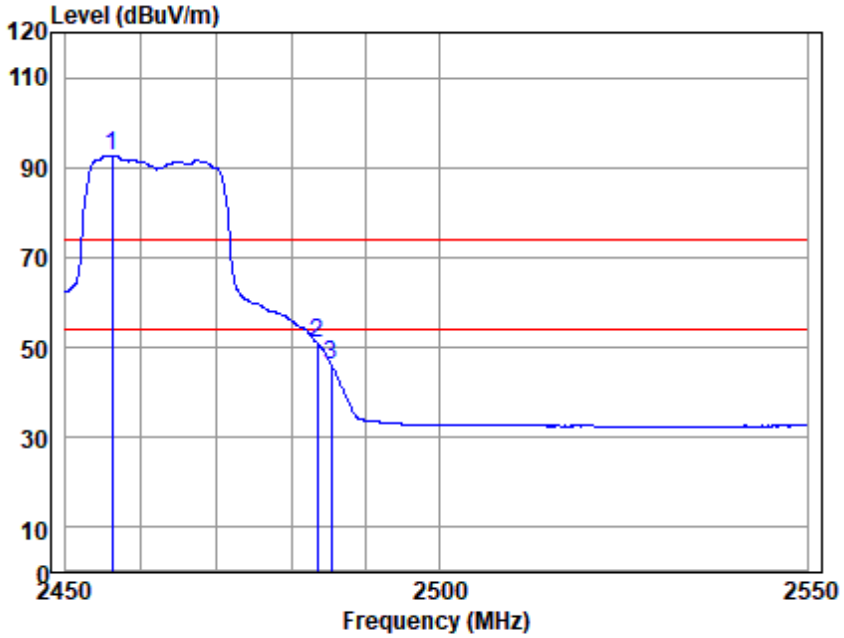


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2456.674	105.67	29.04	3.39	35.24	102.86	74.00	28.86	Peak
2483.500	73.69	29.09	3.36	35.26	70.88	74.00	-3.12	Peak
2484.745	72.45	29.09	3.36	35.26	69.64	74.00	-4.36	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

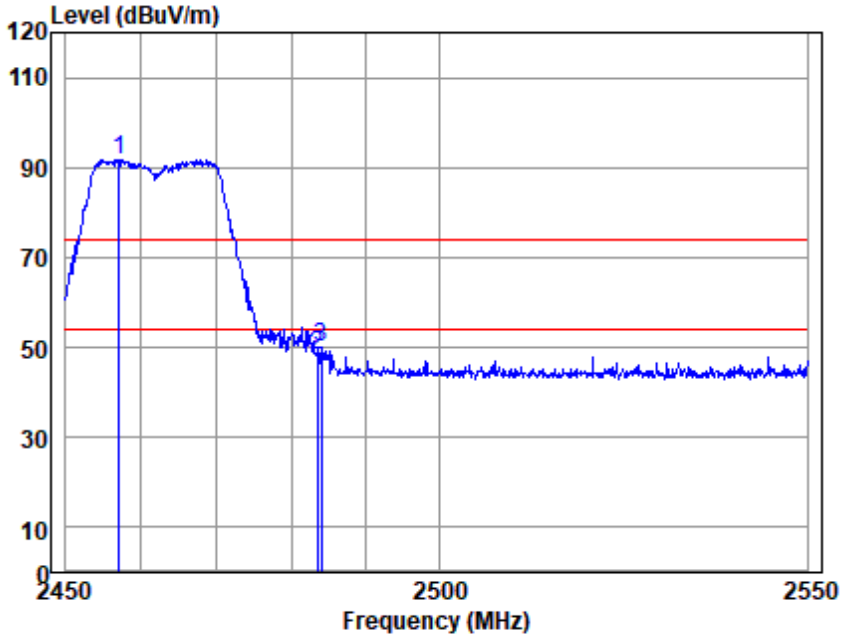


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2456.183	95.47	29.04	3.39	35.24	92.66	54.00	38.66	Average
2483.500	53.81	29.09	3.36	35.26	51.00	54.00	-3.00	Average
2485.341	49.01	29.09	3.36	35.26	46.20	54.00	-7.80	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

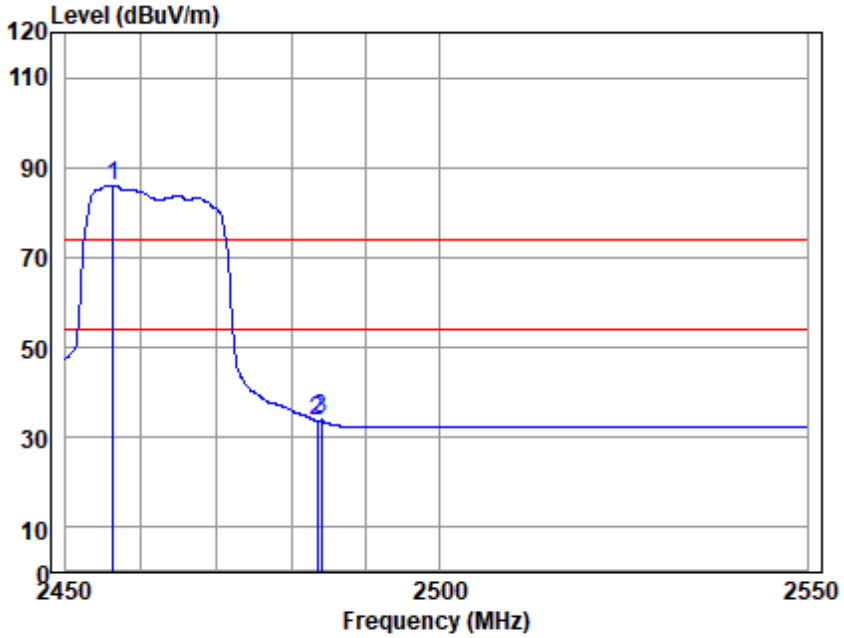


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2457.067	94.55	29.04	3.39	35.24	91.74	74.00	17.74	Peak
2483.500	50.87	29.09	3.36	35.26	48.06	74.00	-25.94	Peak
2484.049	52.70	29.09	3.36	35.26	49.89	74.00	-24.11	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

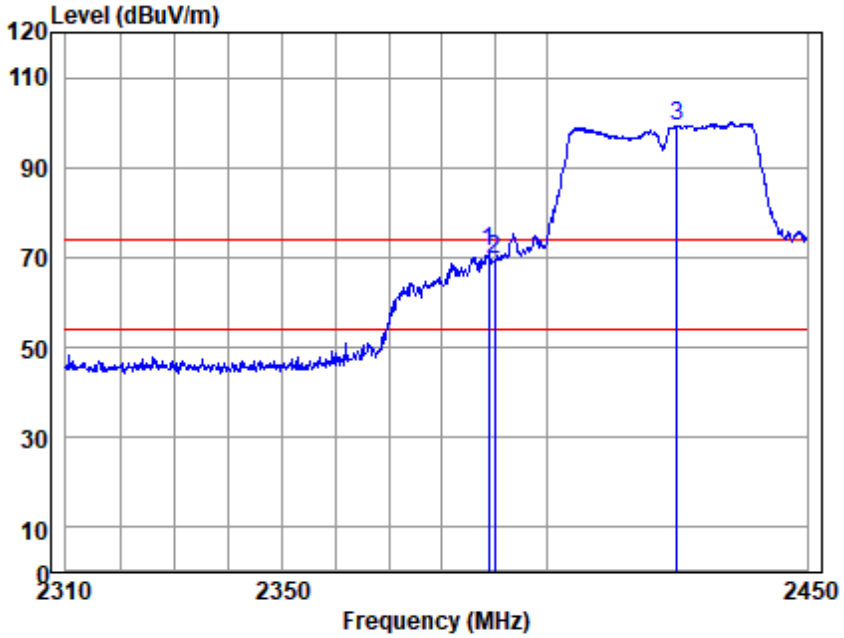


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2456.281	88.87	29.04	3.39	35.24	86.06	54.00	32.06	Average
2483.500	36.45	29.09	3.36	35.26	33.64	54.00	-20.36	Average
2484.049	36.69	29.09	3.36	35.26	33.88	54.00	-20.12	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low

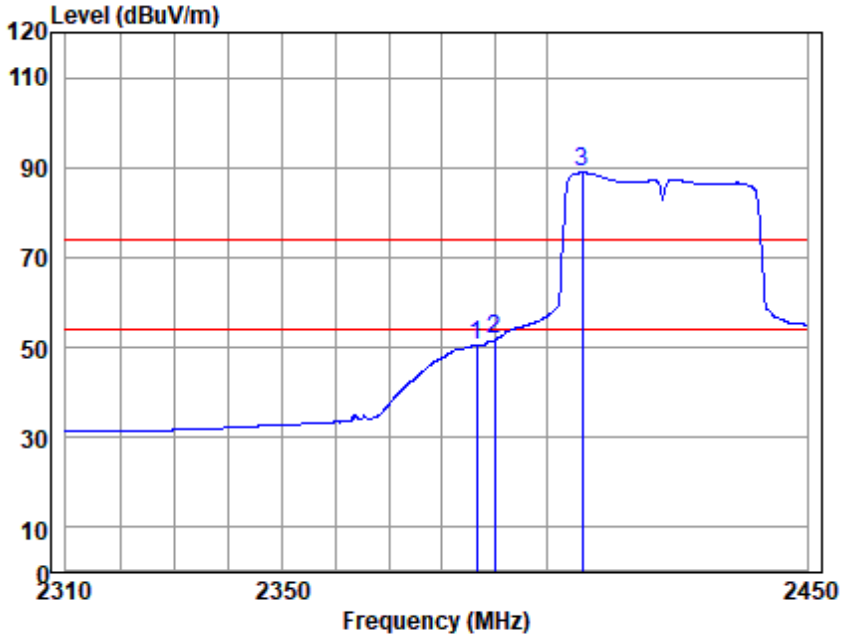


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2388.930	74.53	28.80	3.34	35.18	71.49	74.00	-2.51	Peak
2390.000	72.41	28.80	3.34	35.18	69.37	74.00	-4.63	Peak
2424.759	102.36	28.92	3.33	35.21	99.40	74.00	25.40	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low

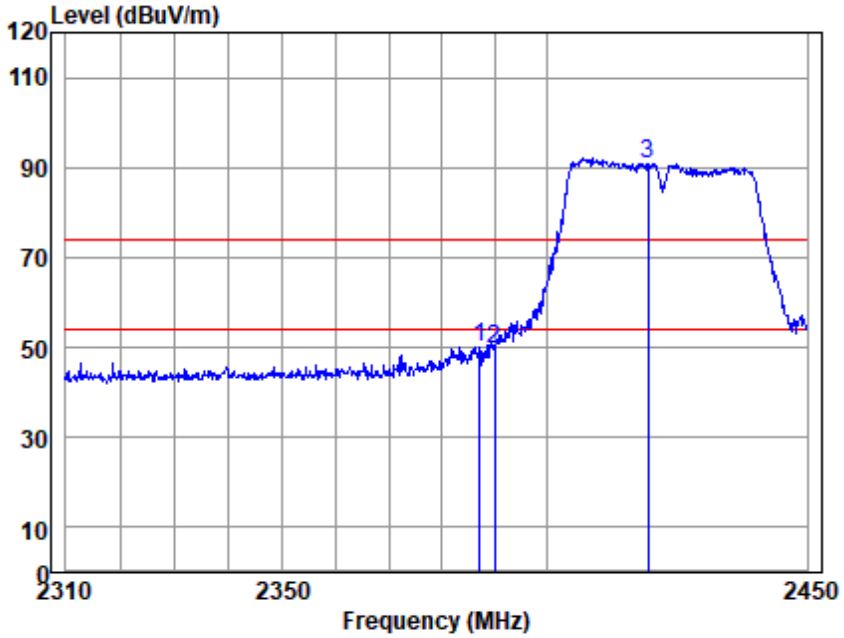


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2386.541	53.42	28.80	3.34	35.18	50.38	54.00	-3.62	Average
2390.000	54.71	28.80	3.34	35.18	51.67	54.00	-2.33	Average
2406.707	91.84	28.89	3.33	35.20	88.86	54.00	34.86	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low

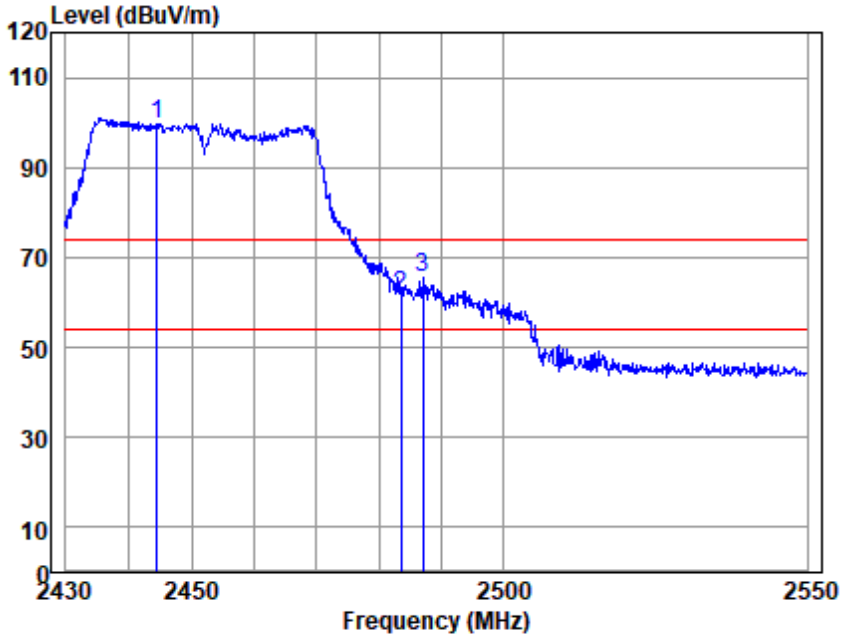


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2387.243	53.07	28.80	3.34	35.18	50.03	74.00	-23.97	Peak
2390.000	52.69	28.80	3.34	35.18	49.65	74.00	-24.35	Peak
2419.343	93.90	28.92	3.33	35.21	90.94	74.00	16.94	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High

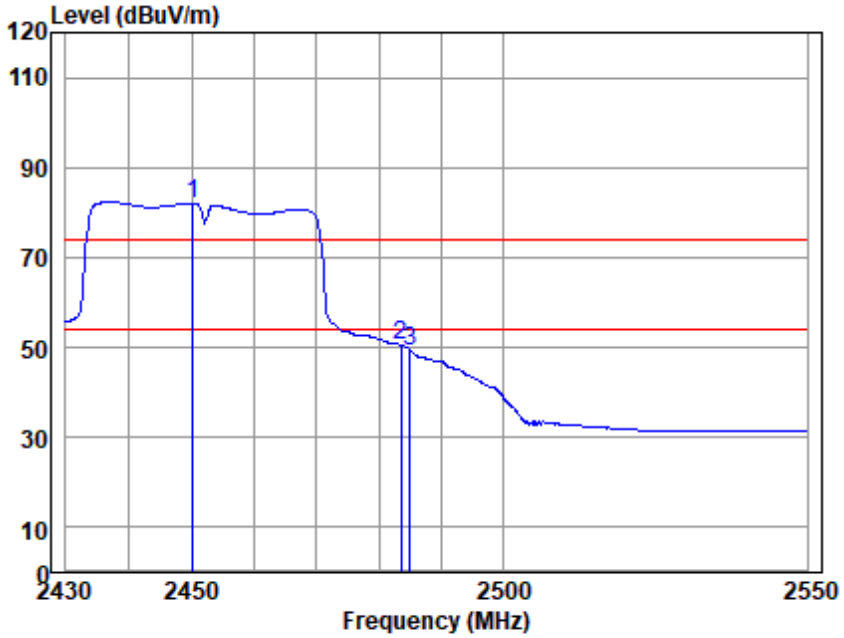


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2444.450	102.51	28.99	3.32	35.22	99.60	74.00	25.60	Peak
2483.500	64.29	29.09	3.36	35.26	61.48	74.00	-12.52	Peak
2487.118	68.14	29.09	3.36	35.26	65.33	74.00	-8.67	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High

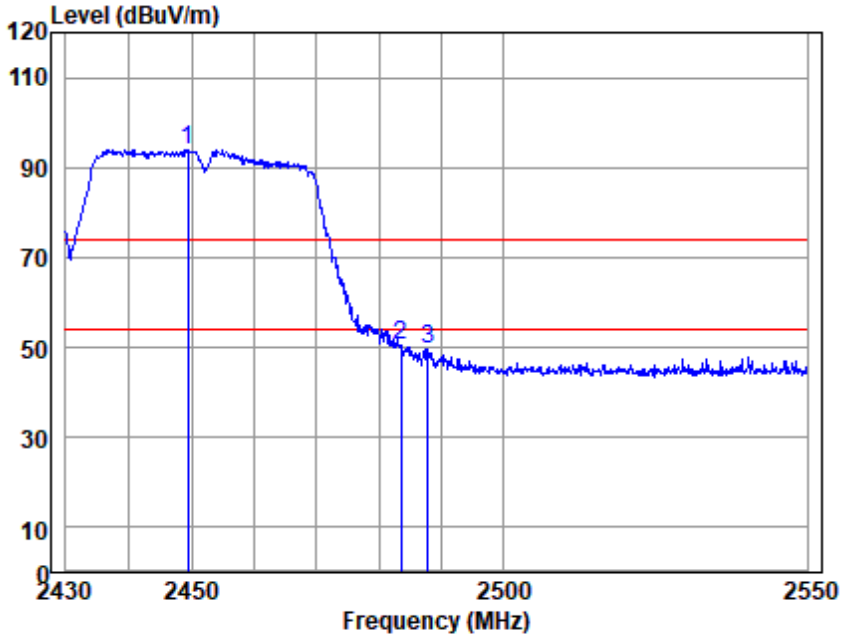


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2450.230	84.92	29.02	3.36	35.23	82.07	54.00	28.07	Average
2483.500	53.39	29.09	3.36	35.26	50.58	54.00	-3.42	Average
2485.081	52.17	29.09	3.36	35.26	49.36	54.00	-4.64	Average

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
2449.404	96.88	29.02	3.36	35.23	94.03	74.00	20.03	Peak
2483.500	53.20	29.09	3.36	35.26	50.39	74.00	-23.61	Peak
2487.838	52.40	29.09	3.36	35.26	49.59	74.00	-24.41	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7.3 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4,6.5
Measurement Distance: 3m

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

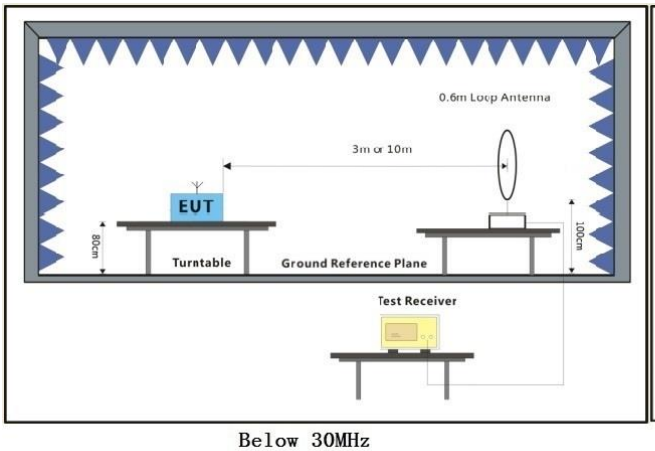
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 20 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

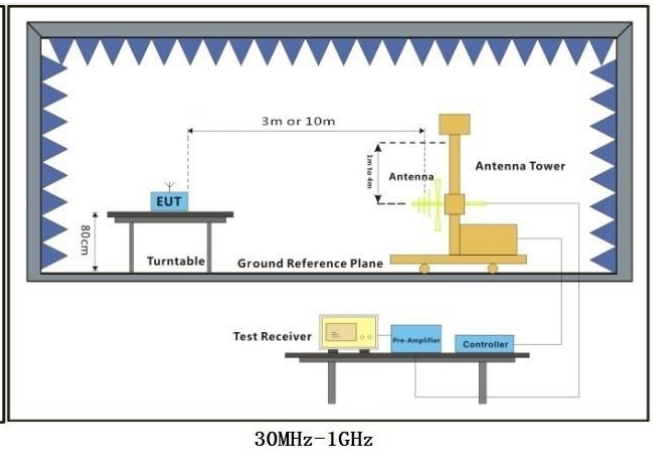
7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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



Below 30MHz



30MHz-1GHz

7.3.4 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

i. Repeat above procedures until all frequencies measured was complete.

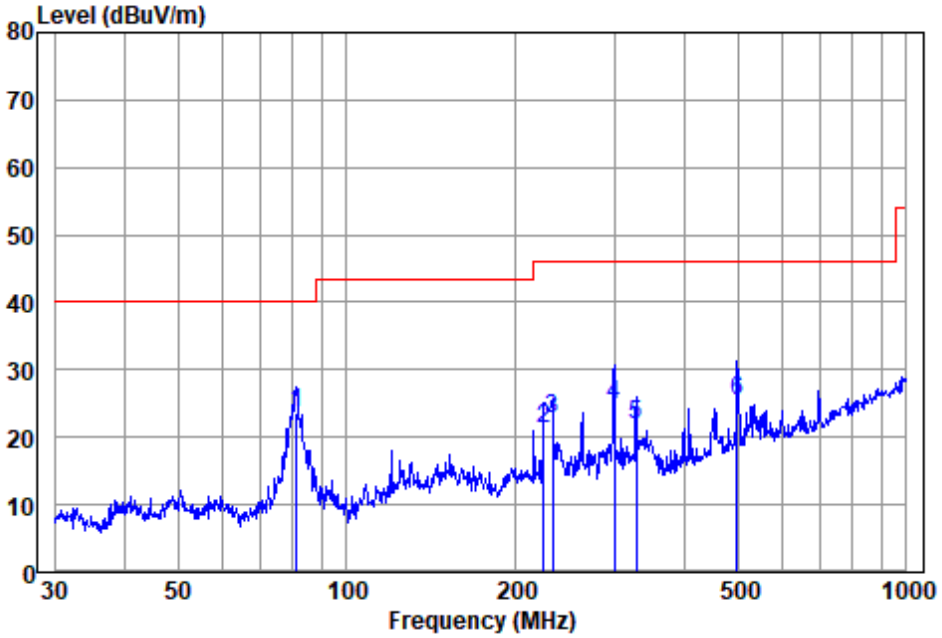
Remark:

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

2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3: This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for b/g modulation and MIMO antenna operation for n modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.

Test Mode: 00; Polarity: Horizontal

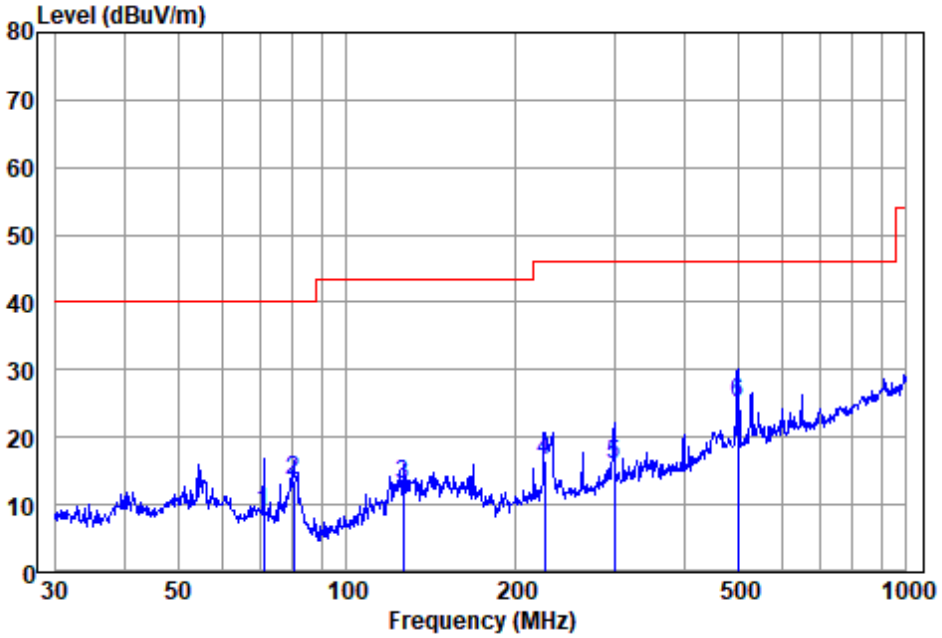


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	81.212	46.14	8.75	1.87	33.20	23.56	40.00	-16.44	QP
2	224.519	40.93	9.99	3.17	32.90	21.19	46.00	-24.81	QP
3	233.349	41.99	10.40	3.24	32.86	22.77	46.00	-23.23	QP
4	300.367	40.33	13.40	3.86	32.80	24.79	46.00	-21.21	QP
5	329.039	36.41	14.28	3.93	32.74	21.88	46.00	-24.12	QP
6	497.677	35.10	17.96	4.91	32.70	25.27	46.00	-20.73	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical



Antenna Polarity :VERTICAL
EUT/Project :0043HS
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	71.080	29.32	11.10	1.72	33.20	8.94	40.00	-31.06	QP
2	80.362	35.86	8.93	1.87	33.20	13.46	40.00	-26.54	QP
3	125.886	31.97	11.70	2.34	33.09	12.92	43.50	-30.58	QP
4	225.308	36.32	10.01	3.18	32.89	16.62	46.00	-29.38	QP
5	300.367	31.57	13.40	3.86	32.80	16.03	46.00	-29.97	QP
6	499.425	34.81	18.00	4.92	32.70	25.03	46.00	-20.97	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7.4 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.6
Measurement Distance: 3m

Limit:

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

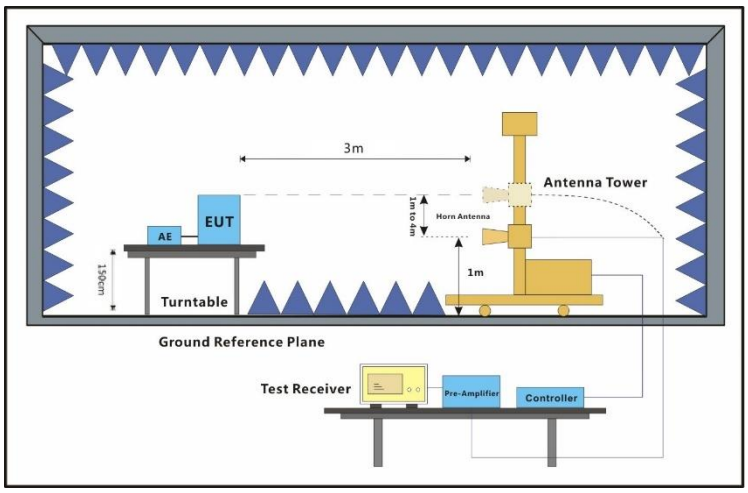
7.4.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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 fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

i. Repeat above procedures until all frequencies measured was complete.

Remark:

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

2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

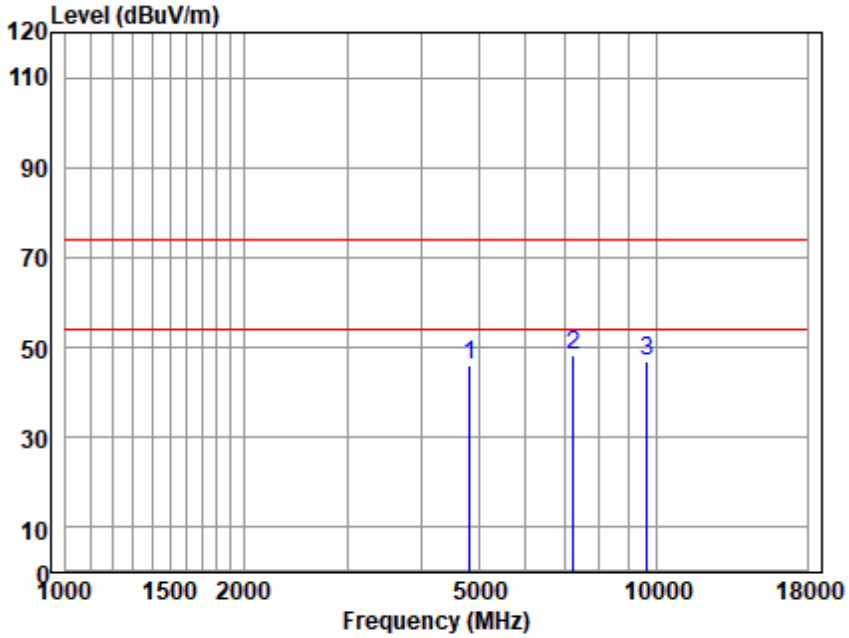
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.

5:For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geqslant$1/T (Duty cycle$<$98%) or 10Hz (Duty cycle$\geqslant$98%) for Average detection (AV) at frequency above 1GHz.

6:This test item was investigated while operating in SISO and MIMO mode, however, it was determined that SISO antenna 1 operation for b/g modulation and MIMO antenna operation for n modulation produced the worst emissions. So the emissions produced from other operation are not recorded in report.

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

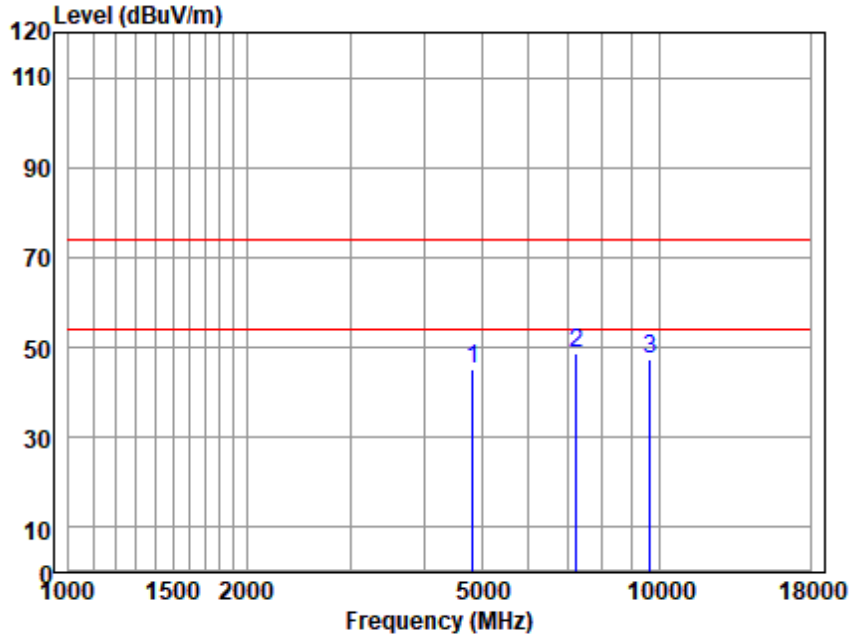


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.016	43.79	33.60	5.41	36.79	46.01	74.00	-27.99	Peak
7242.052	40.47	36.29	7.18	35.50	48.44	74.00	-25.56	Peak
9641.257	34.01	37.71	8.64	33.56	46.80	74.00	-27.20	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

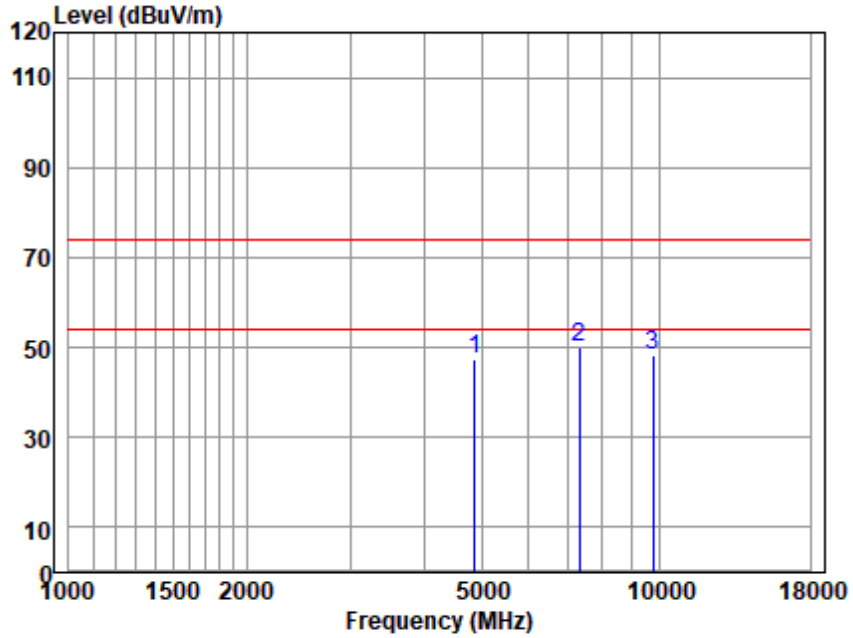


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.016	43.11	33.60	5.41	36.79	45.33	74.00	-28.67	Peak
7242.052	40.85	36.29	7.18	35.50	48.82	74.00	-25.18	Peak
9641.257	34.42	37.71	8.64	33.56	47.21	74.00	-26.79	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

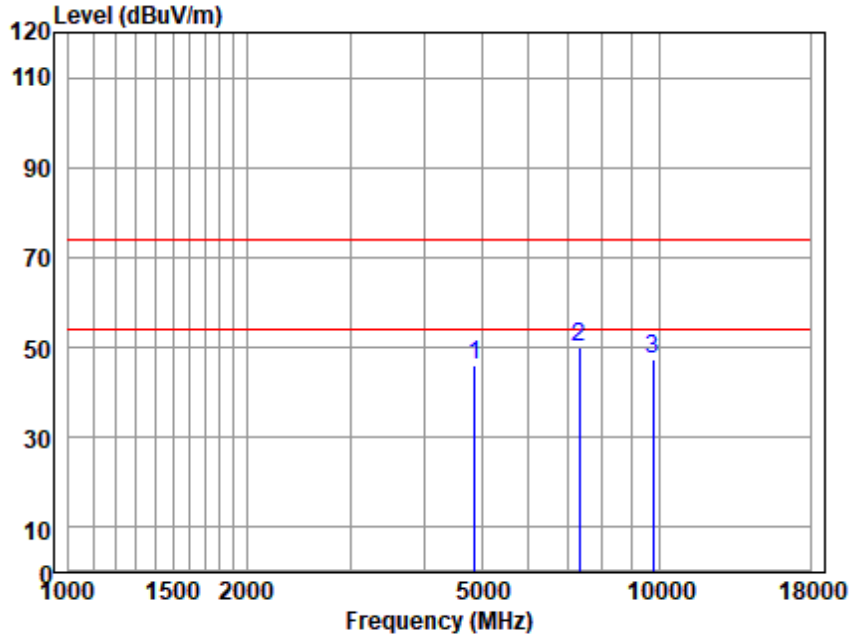


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	45.36	33.66	5.28	36.81	47.49	74.00	-26.51	Peak
7311.122	41.97	36.32	7.34	35.44	50.19	74.00	-23.81	Peak
9753.371	35.39	37.54	8.84	33.50	48.27	74.00	-25.73	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

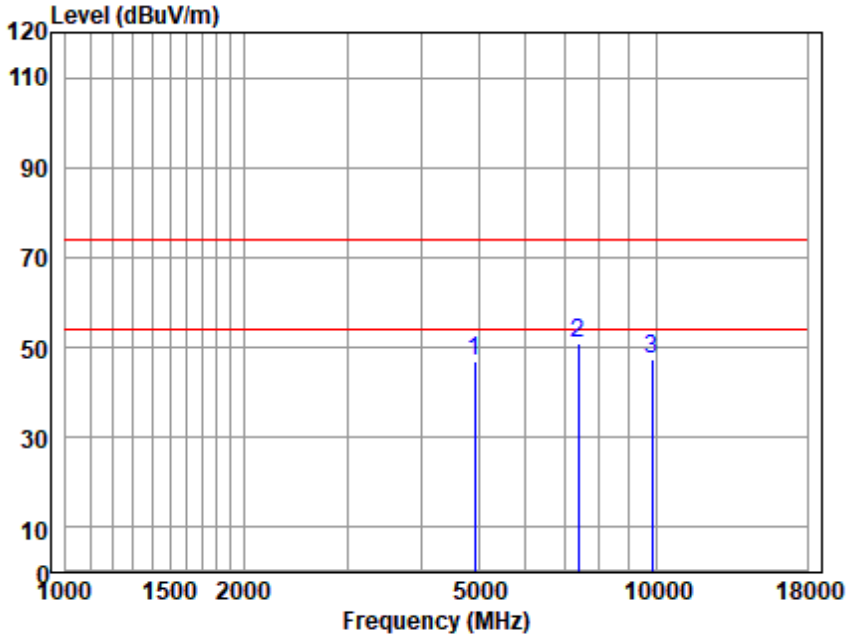


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	43.92	33.66	5.28	36.81	46.05	74.00	-27.95	Peak
7311.000	41.60	36.32	7.34	35.44	49.82	74.00	-24.18	Peak
9753.371	34.45	37.54	8.84	33.50	47.33	74.00	-26.67	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

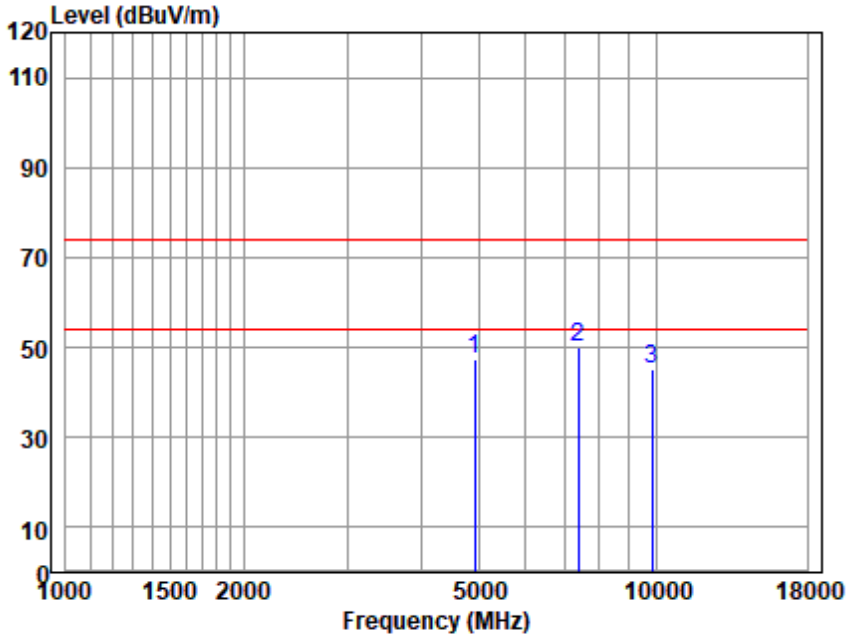


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4924.721	44.93	33.64	5.37	36.82	47.12	74.00	-26.88	Peak
7390.070	42.53	36.36	7.29	35.37	50.81	74.00	-23.19	Peak
9838.312	34.21	37.60	8.82	33.45	47.18	74.00	-26.82	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

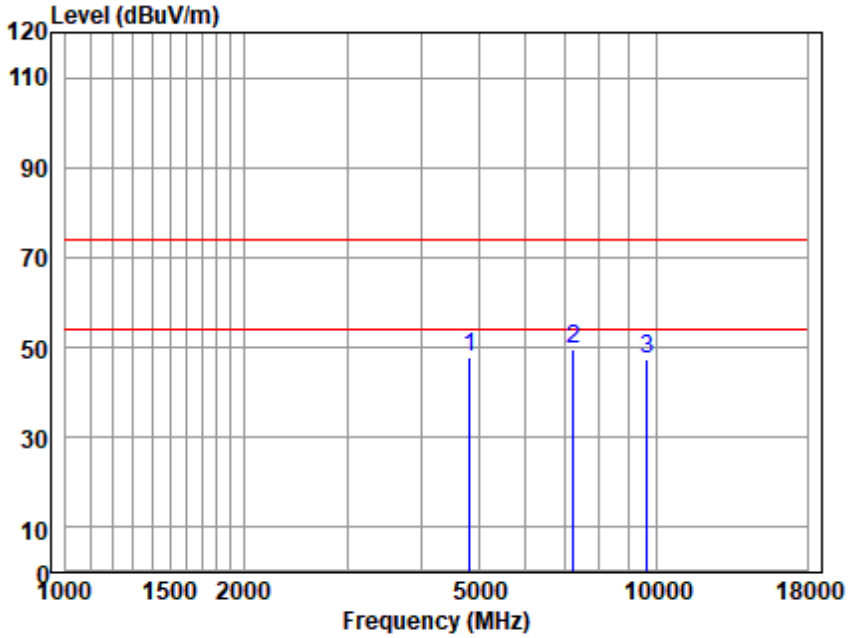


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4924.721	45.01	33.64	5.37	36.82	47.20	74.00	-26.80	Peak
7390.070	41.68	36.36	7.29	35.37	49.96	74.00	-24.04	Peak
9838.312	32.09	37.60	8.82	33.45	45.06	74.00	-28.94	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

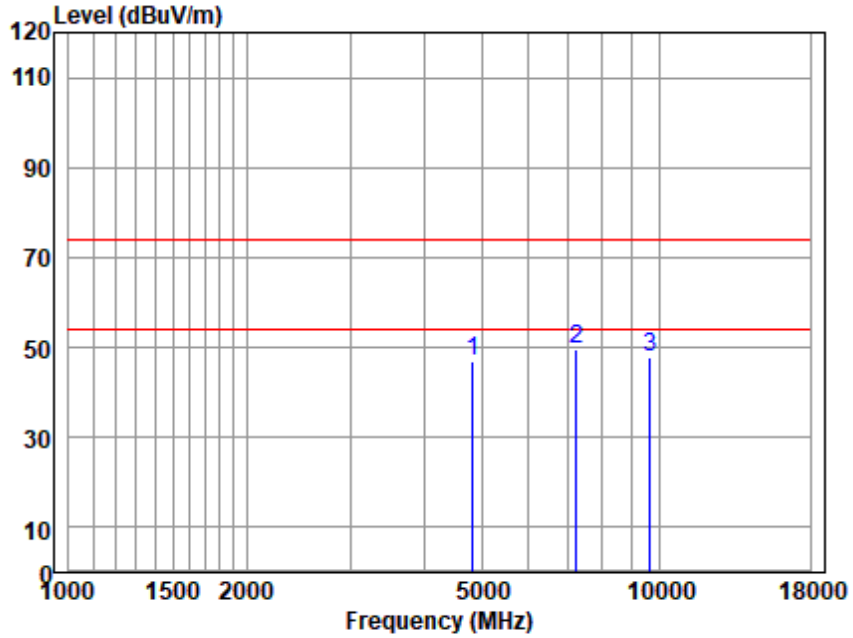


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.016	45.39	33.60	5.41	36.79	47.61	74.00	-26.39	Peak
7242.052	41.53	36.29	7.18	35.50	49.50	74.00	-24.50	Peak
9641.257	34.45	37.71	8.64	33.56	47.24	74.00	-26.76	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

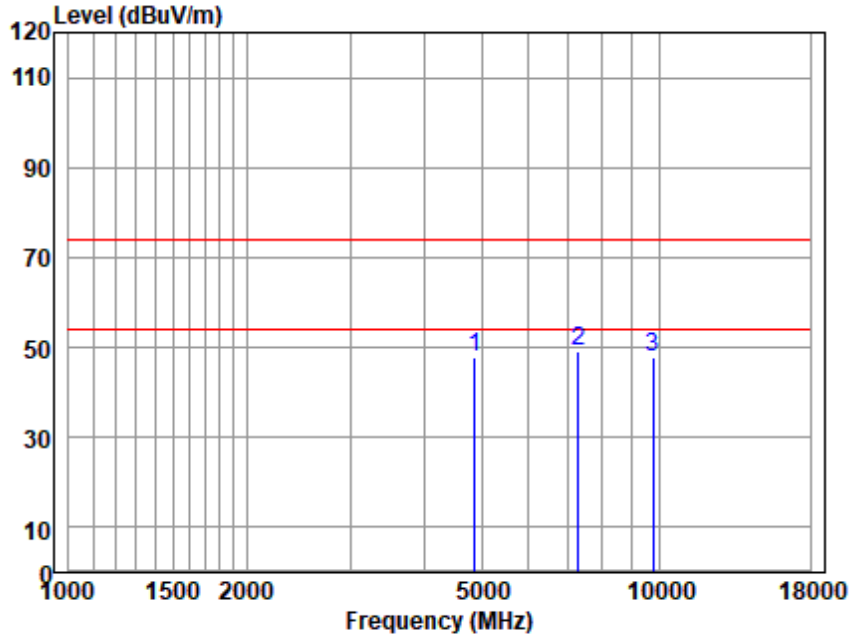


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.016	44.85	33.60	5.41	36.79	47.07	74.00	-26.93	Peak
7242.052	41.84	36.29	7.18	35.50	49.81	74.00	-24.19	Peak
9641.257	34.98	37.71	8.64	33.56	47.77	74.00	-26.23	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

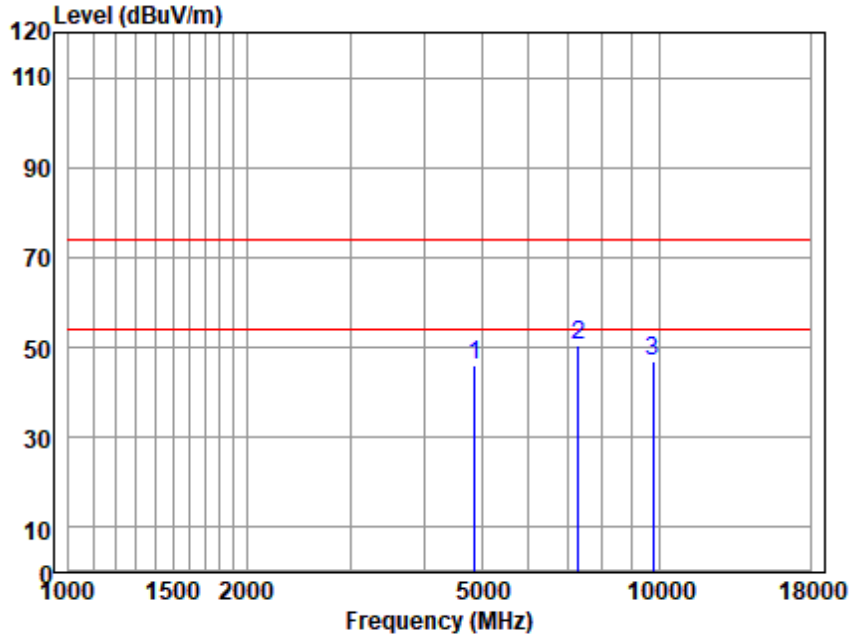


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	45.54	33.66	5.28	36.81	47.67	74.00	-26.33	Peak
7305.122	41.07	36.32	7.34	35.44	49.29	74.00	-24.71	Peak
9753.371	34.73	37.54	8.84	33.50	47.61	74.00	-26.39	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

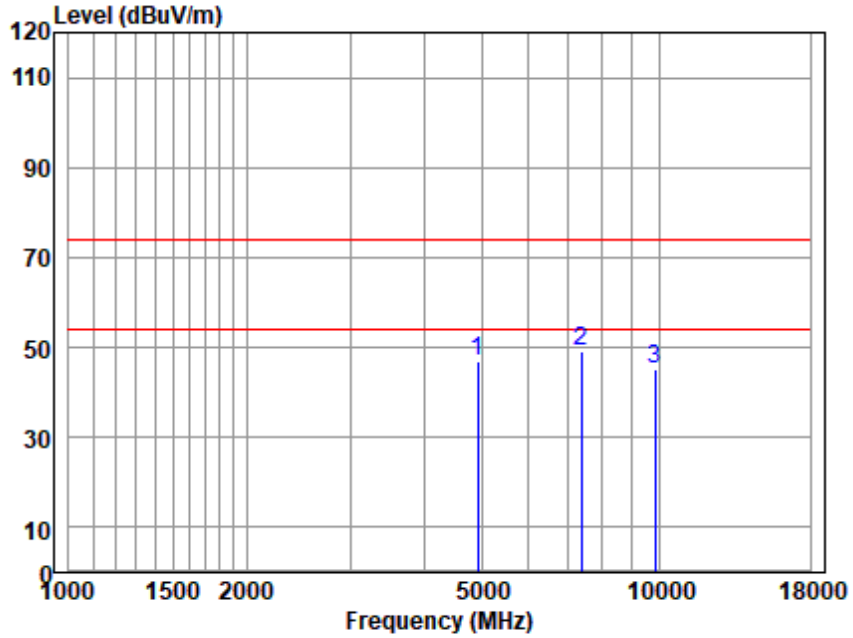


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	44.03	33.66	5.28	36.81	46.16	74.00	-27.84	Peak
7305.122	42.27	36.32	7.34	35.44	50.49	74.00	-23.51	Peak
9753.371	34.03	37.54	8.84	33.50	46.91	74.00	-27.09	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

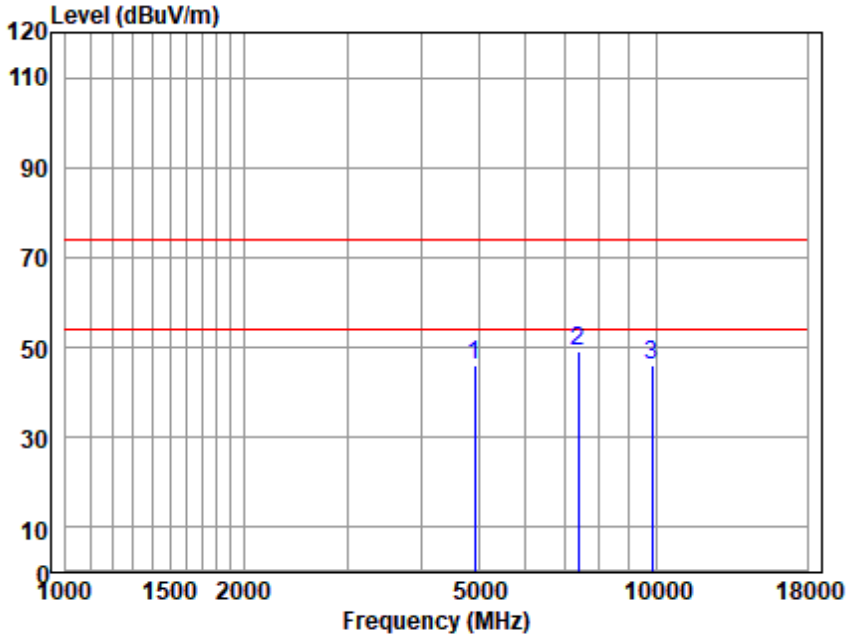


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4924.721	44.64	33.64	5.37	36.82	46.83	74.00	-27.17	Peak
7390.070	40.81	36.36	7.29	35.37	49.09	74.00	-24.91	Peak
9838.312	32.24	37.60	8.82	33.45	45.21	74.00	-28.79	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

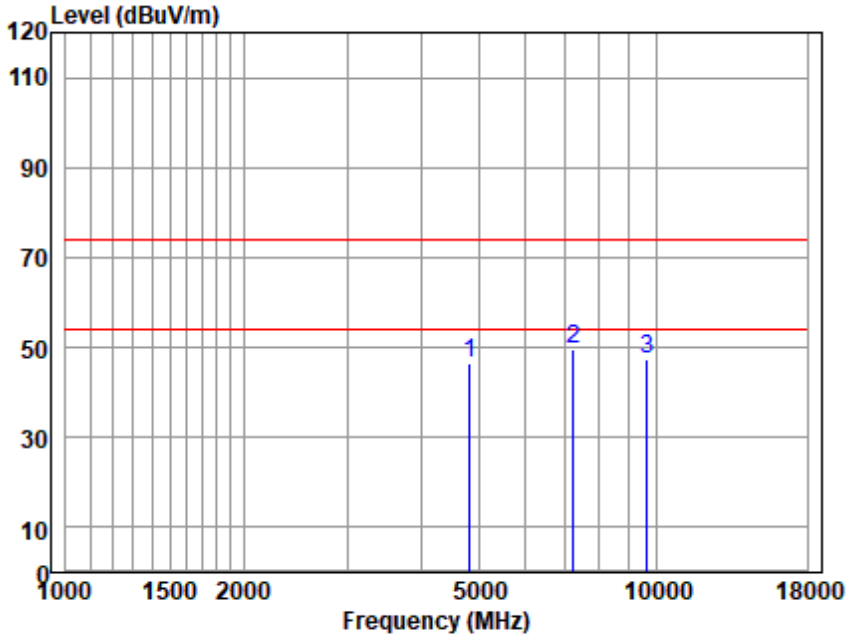


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4924.721	43.74	33.64	5.37	36.82	45.93	74.00	-28.07	Peak
7390.070	40.81	36.36	7.29	35.37	49.09	74.00	-24.91	Peak
9838.312	33.17	37.60	8.82	33.45	46.14	74.00	-27.86	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

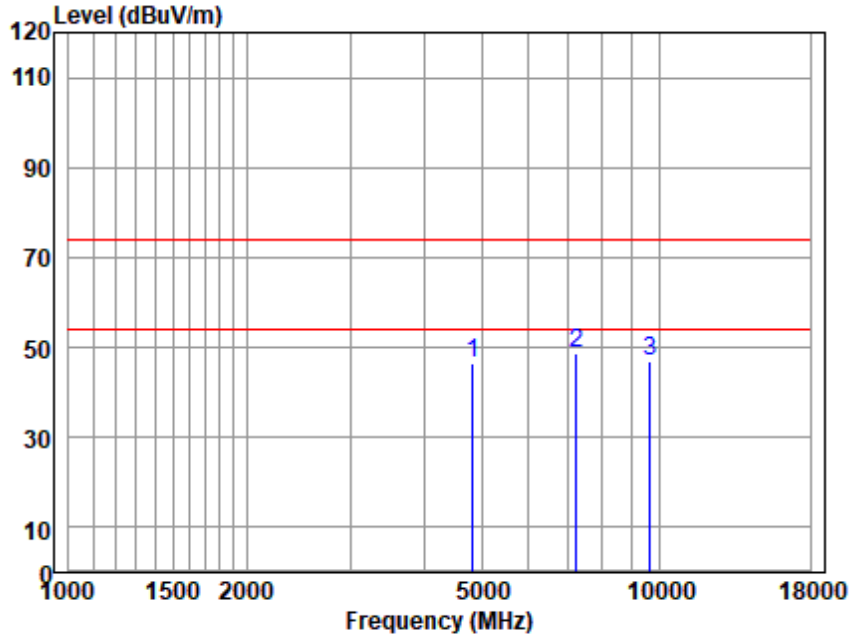


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.016	44.19	33.60	5.41	36.79	46.41	74.00	-27.59	Peak
7242.052	41.55	36.29	7.18	35.50	49.52	74.00	-24.48	Peak
9641.257	34.67	37.71	8.64	33.56	47.46	74.00	-26.54	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

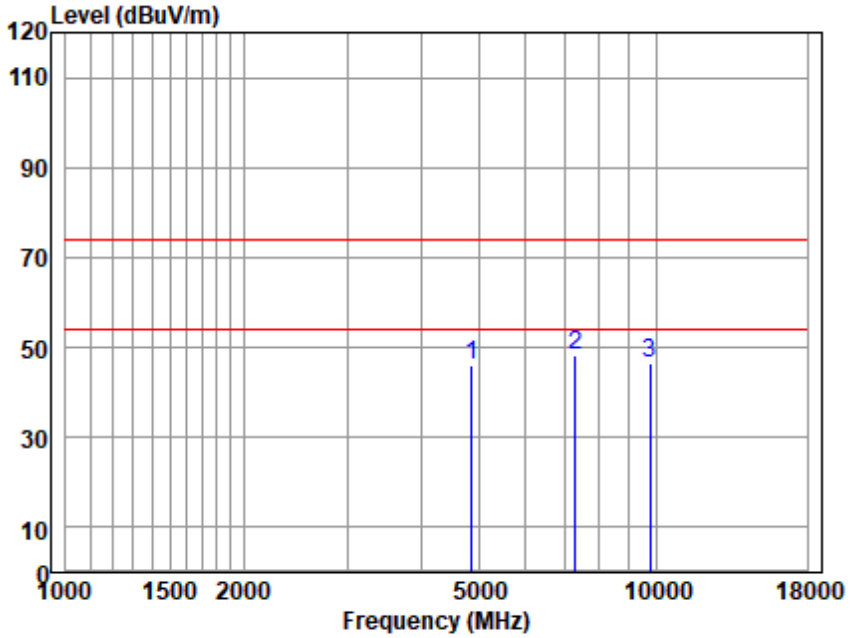


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4824.016	44.49	33.60	5.41	36.79	46.71	74.00	-27.29	Peak
7242.052	40.56	36.29	7.18	35.50	48.53	74.00	-25.47	Peak
9641.257	33.98	37.71	8.64	33.56	46.77	74.00	-27.23	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

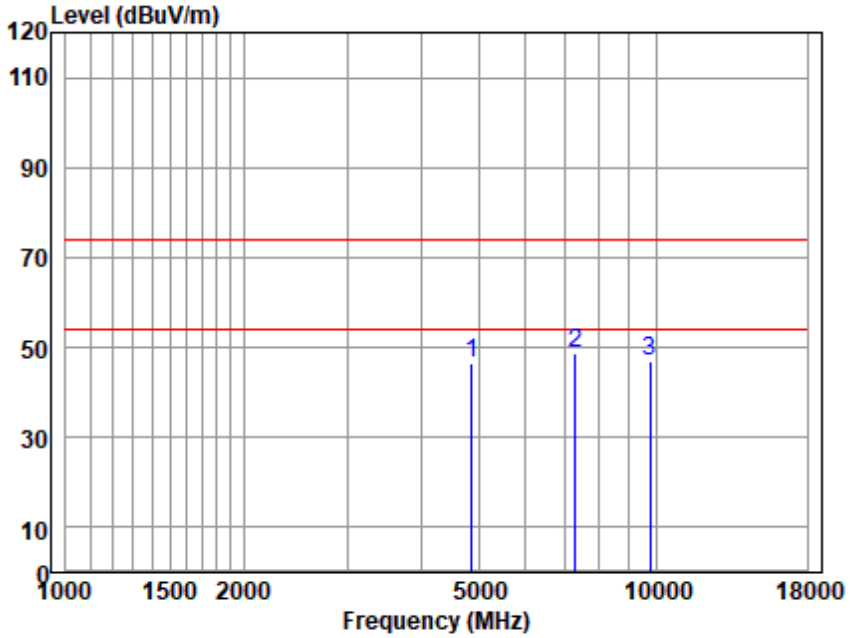


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	43.93	33.66	5.28	36.81	46.06	74.00	-27.94	Peak
7305.122	40.05	36.32	7.34	35.44	48.27	74.00	-25.73	Peak
9753.371	33.46	37.54	8.84	33.50	46.34	74.00	-27.66	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

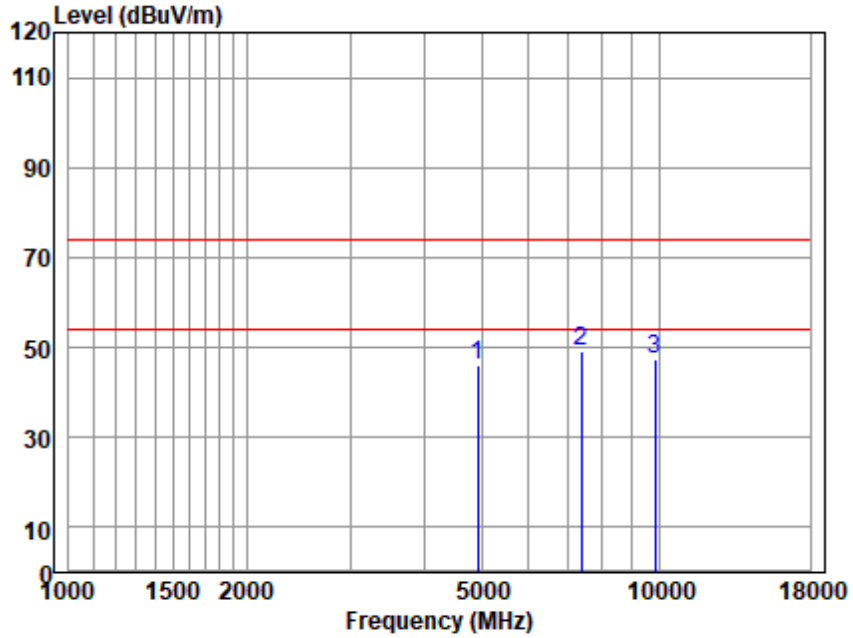


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	44.26	33.66	5.28	36.81	46.39	74.00	-27.61	Peak
7305.122	40.57	36.32	7.34	35.44	48.79	74.00	-25.21	Peak
9753.371	34.19	37.54	8.84	33.50	47.07	74.00	-26.93	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

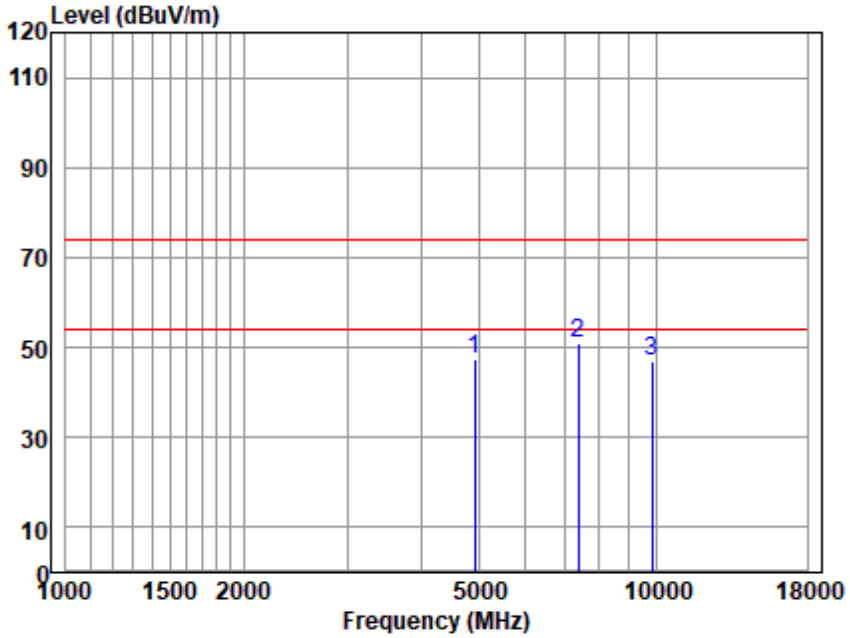


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4924.721	44.08	33.64	5.37	36.82	46.27	74.00	-27.73	Peak
7390.070	40.93	36.36	7.29	35.37	49.21	74.00	-24.79	Peak
9838.312	34.33	37.60	8.82	33.45	47.30	74.00	-26.70	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

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

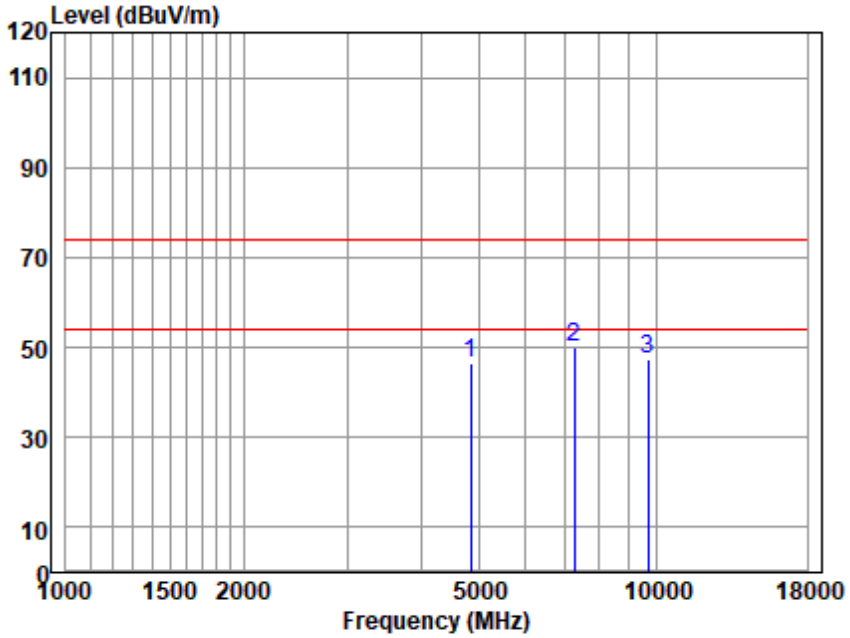


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4924.721	45.11	33.64	5.37	36.82	47.30	74.00	-26.70	Peak
7390.070	42.48	36.36	7.29	35.37	50.76	74.00	-23.24	Peak
9838.312	34.05	37.60	8.82	33.45	47.02	74.00	-26.98	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low

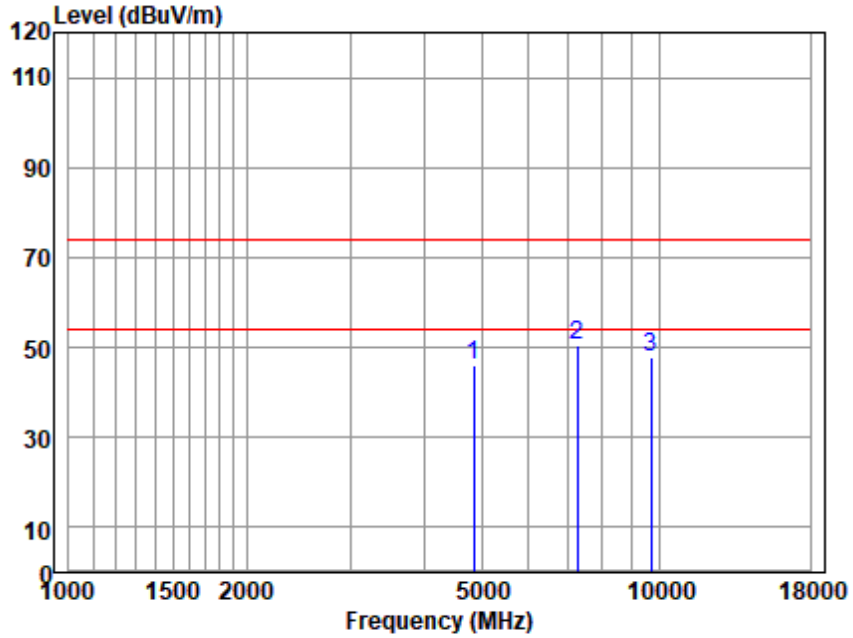


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4844.948	44.34	33.66	5.43	36.80	46.63	74.00	-27.37	Peak
7263.015	41.86	36.30	7.28	35.48	49.96	74.00	-24.04	Peak
9697.151	34.74	37.62	8.60	33.53	47.43	74.00	-26.57	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low

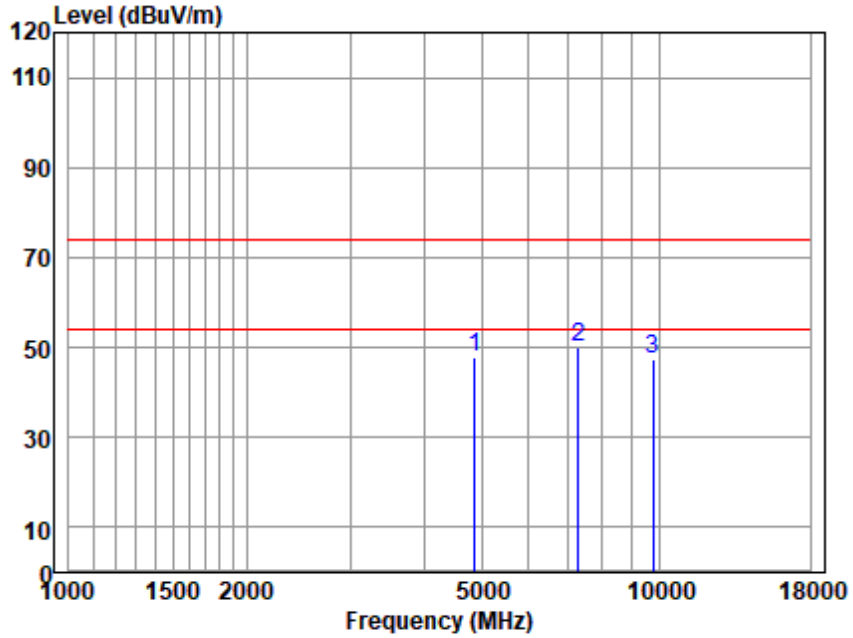


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4844.948	43.76	33.66	5.43	36.80	46.05	74.00	-27.95	Peak
7263.015	42.32	36.30	7.28	35.48	50.42	74.00	-23.58	Peak
9697.151	35.29	37.62	8.60	33.53	47.98	74.00	-26.02	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle

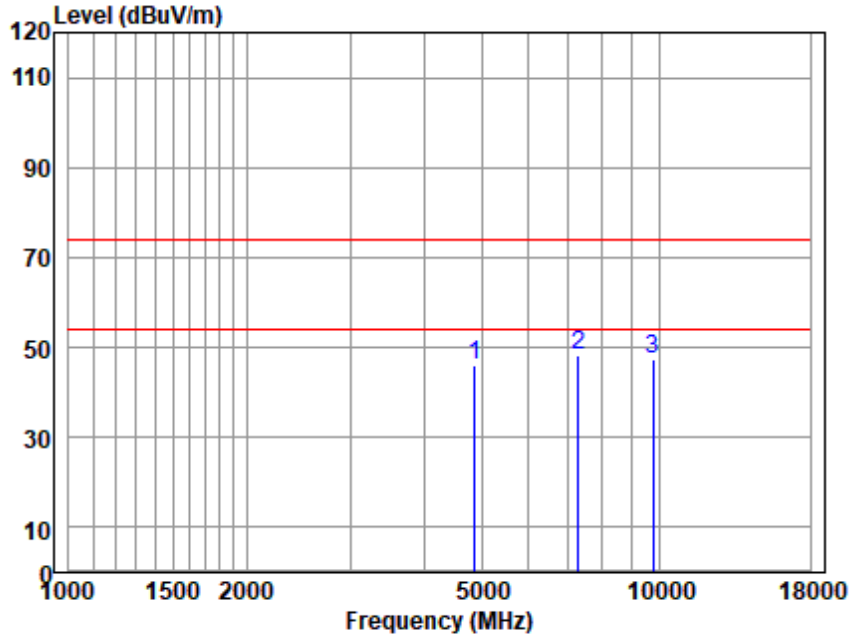


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	45.55	33.66	5.28	36.81	47.68	74.00	-26.32	Peak
7305.122	41.73	36.32	7.34	35.44	49.95	74.00	-24.05	Peak
9753.371	34.55	37.54	8.84	33.50	47.43	74.00	-26.57	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle

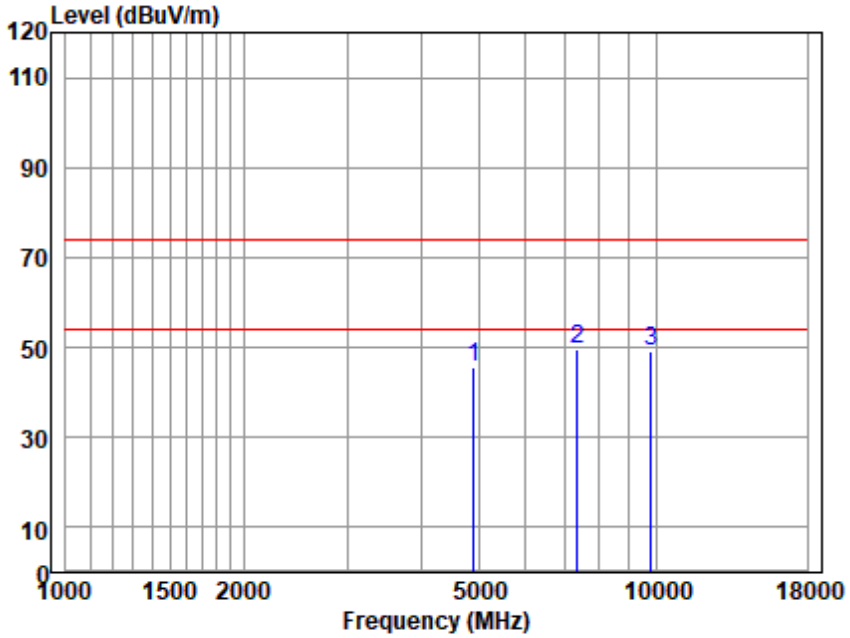


Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4874.043	44.02	33.66	5.28	36.81	46.15	74.00	-27.85	Peak
7305.122	40.20	36.32	7.34	35.44	48.42	74.00	-25.58	Peak
9753.371	34.65	37.54	8.84	33.50	47.53	74.00	-26.47	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High

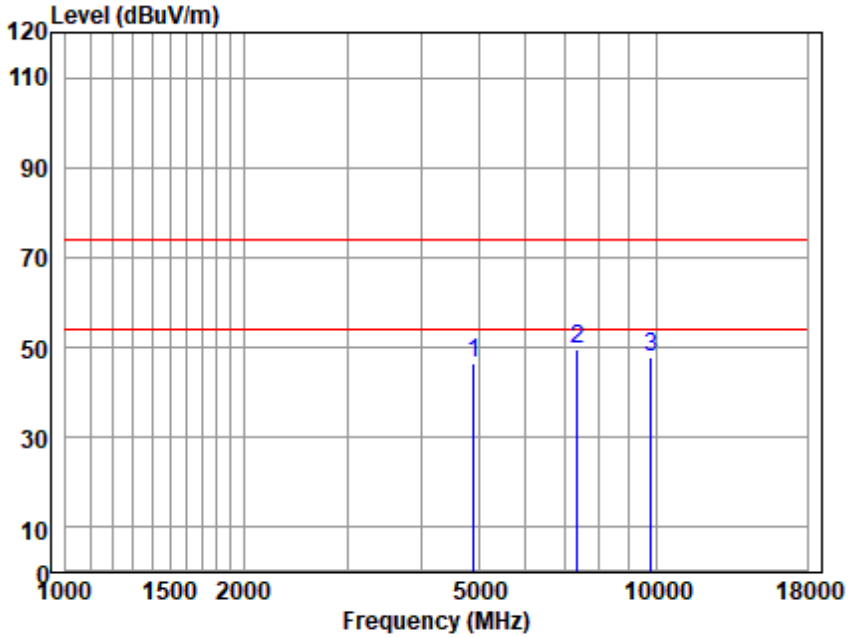


Antenna Polarity :HORIZONTAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4904.300	43.60	33.66	5.36	36.81	45.81	74.00	-28.19	Peak
7347.474	41.49	36.35	7.31	35.41	49.74	74.00	-24.26	Peak
9809.916	36.28	37.57	8.76	33.47	49.14	74.00	-24.86	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Antenna Polarity :VERTICAL
EUT/Project :0043HS

Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
4904.300	44.37	33.66	5.36	36.81	46.58	74.00	-27.42	Peak
7347.474	41.41	36.35	7.31	35.41	49.66	74.00	-24.34	Peak
9809.916	34.76	37.57	8.76	33.47	47.62	74.00	-26.38	Peak

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7.5 Conducted Average Power

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

Test Method: ANSI C63.10 (2013) Section 11.9.2

Measurement Distance: 3m

Limit:

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

7.5.1 E.U.T. Operation

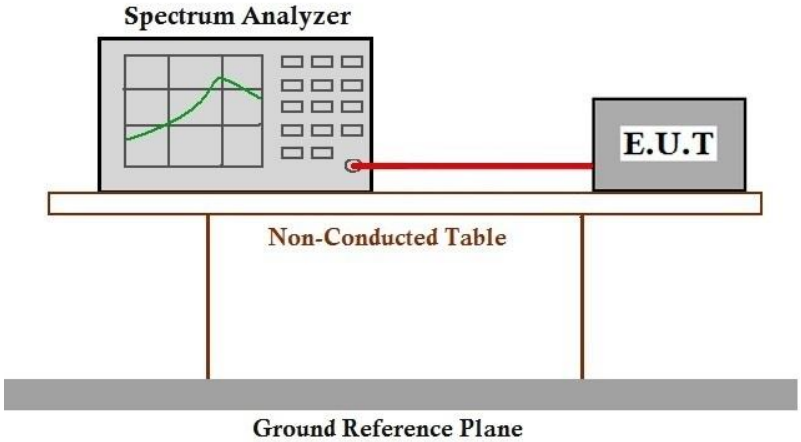
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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 (2013) Section 11.8.1
Limit: ≥500 kHz

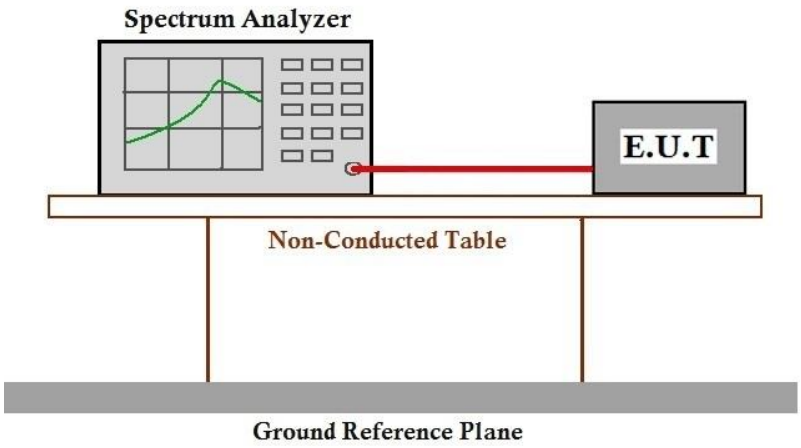
7.6.1 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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 (2013) Section 11.10.3

Limit:

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

7.7.1 E.U.T. Operation

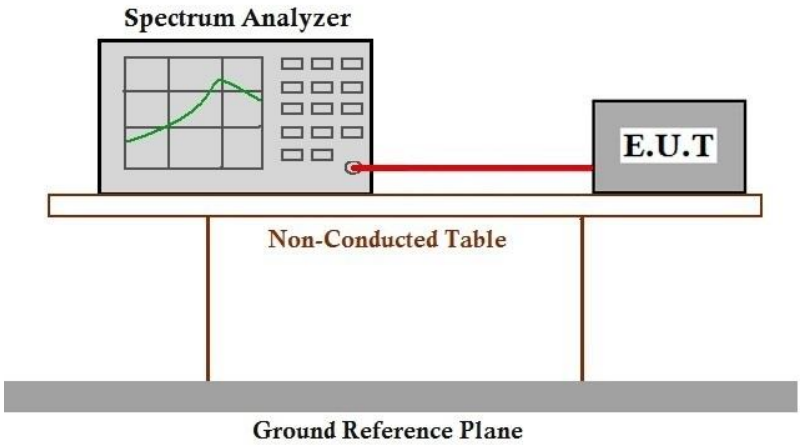
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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 (2013) Section 11.13.3.2

Limit:

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

7.8.1 E.U.T. Operation

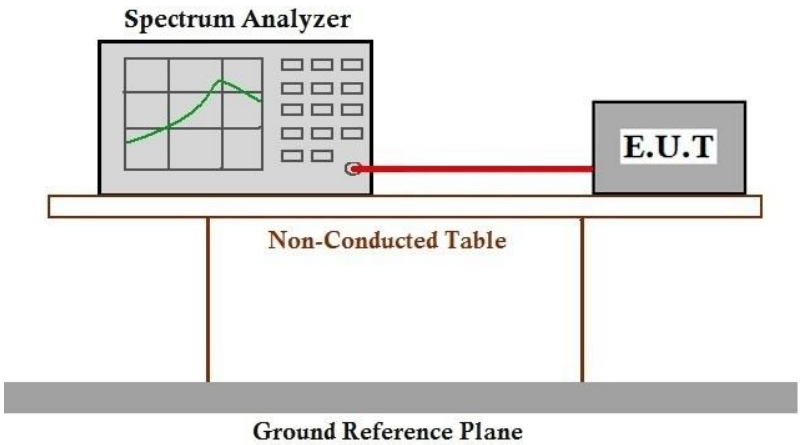
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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 (2013) Section 11.11

Limit:

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

7.9.1 E.U.T. Operation

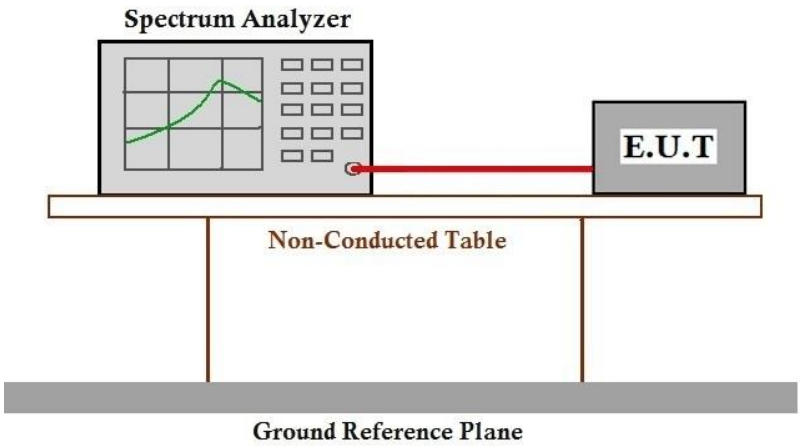
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); 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 Appendix - Test Setup Photo for SHCR2501000043HS

9 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for SHCR2501000043HS

10 Appendix

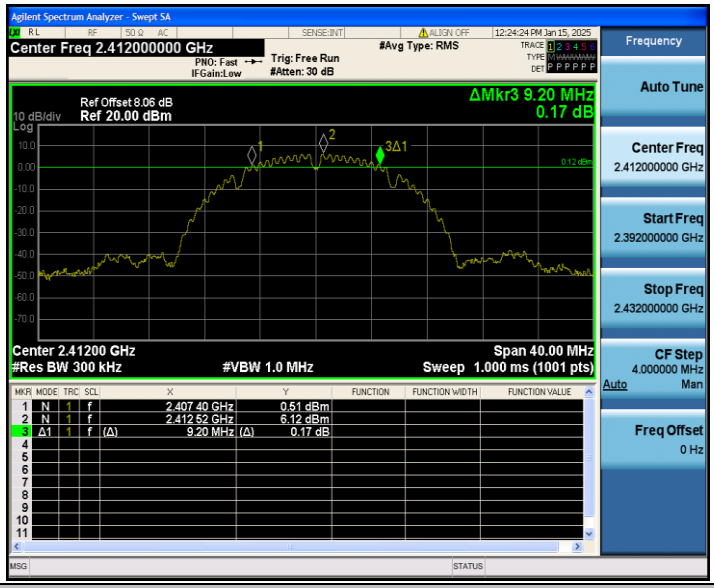
10.1 Appendix A: DTS Bandwidth

10.1.1 Test Result

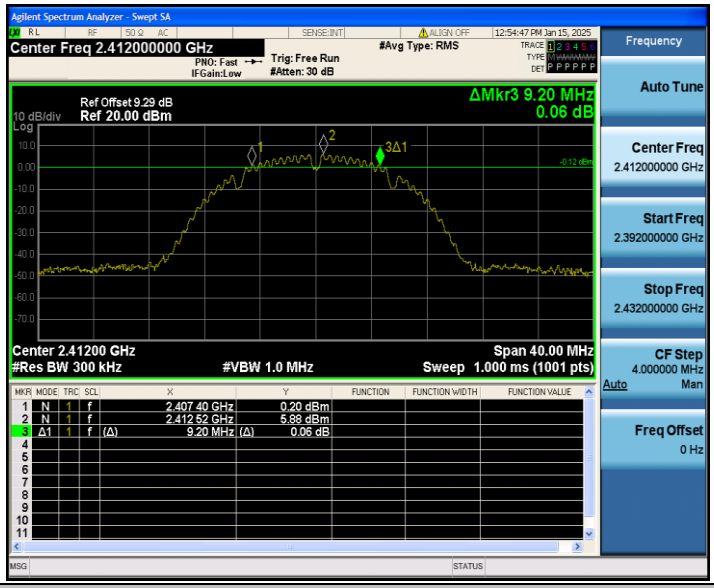
Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.200	2407.400	2416.600	≥0.5	PASS
	Ant2	2412	9.200	2407.400	2416.600	≥0.5	PASS
	Ant1	2437	9.200	2432.400	2441.600	≥0.5	PASS
	Ant2	2437	9.200	2432.400	2441.600	≥0.5	PASS
	Ant1	2462	9.200	2457.400	2466.600	≥0.5	PASS
	Ant2	2462	9.600	2457.000	2466.600	≥0.5	PASS
11G	Ant1	2412	16.320	2403.880	2420.200	≥0.5	PASS
	Ant2	2412	16.360	2403.840	2420.200	≥0.5	PASS
	Ant1	2437	16.360	2428.840	2445.200	≥0.5	PASS
	Ant2	2437	16.400	2428.800	2445.200	≥0.5	PASS
	Ant1	2462	16.320	2453.840	2470.160	≥0.5	PASS
	Ant2	2462	16.360	2453.840	2470.200	≥0.5	PASS
11N20MIMO	Ant1	2412	17.560	2403.240	2420.800	≥0.5	PASS
	Ant2	2412	17.560	2403.200	2420.760	≥0.5	PASS
	Ant1	2437	17.480	2428.240	2445.720	≥0.5	PASS
	Ant2	2437	17.560	2428.240	2445.800	≥0.5	PASS
	Ant1	2462	17.560	2453.200	2470.760	≥0.5	PASS
	Ant2	2462	17.480	2453.280	2470.760	≥0.5	PASS
11N40MIMO	Ant1	2422	36.400	2403.840	2440.240	≥0.5	PASS
	Ant2	2422	36.480	2403.840	2440.320	≥0.5	PASS
	Ant1	2437	36.640	2418.760	2455.400	≥0.5	PASS
	Ant2	2437	36.400	2418.840	2455.240	≥0.5	PASS
	Ant1	2452	36.400	2433.840	2470.240	≥0.5	PASS
	Ant2	2452	36.560	2433.760	2470.320	≥0.5	PASS

10.1.2 Test Graphs

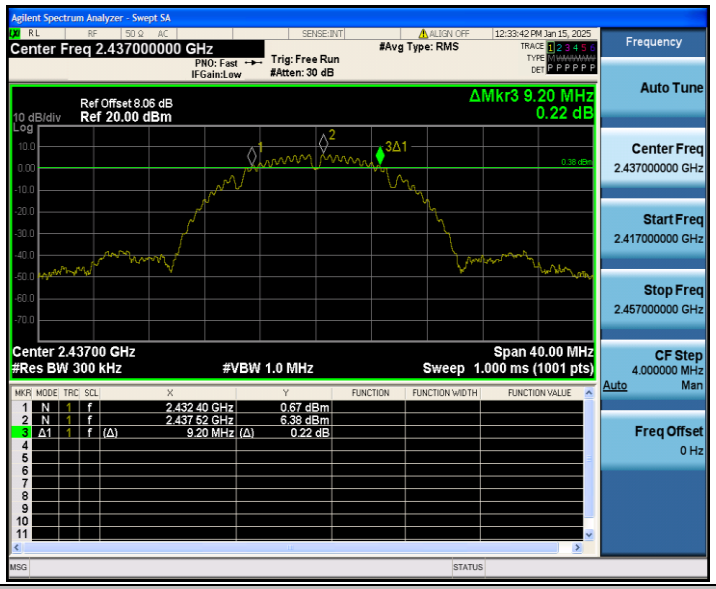
11B_Ant1_2412



11B_Ant2_2412



11B_Ant1_2437



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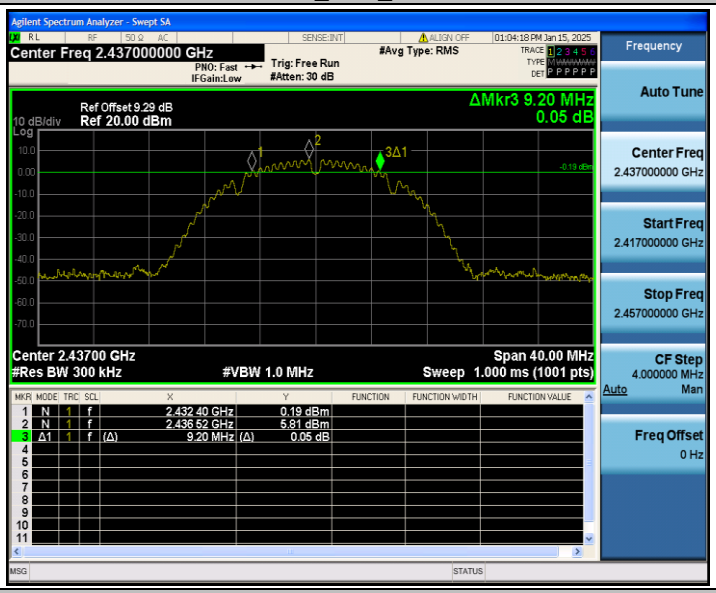
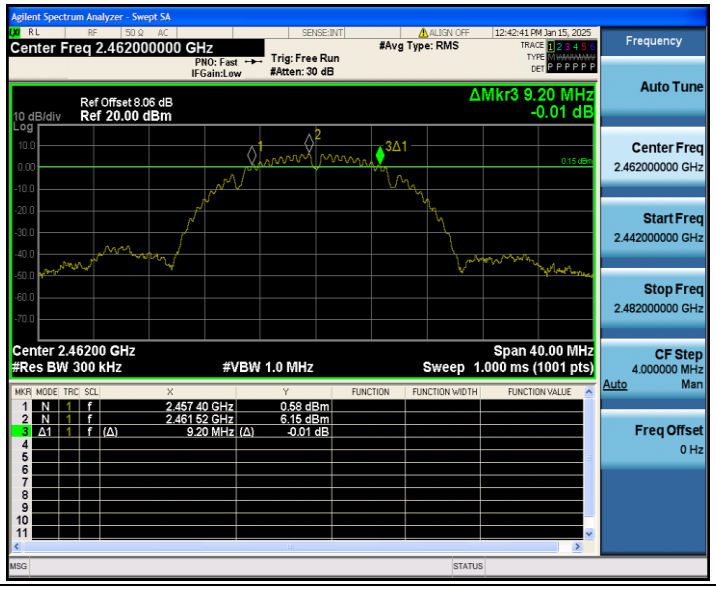


11B_Ant1_2462



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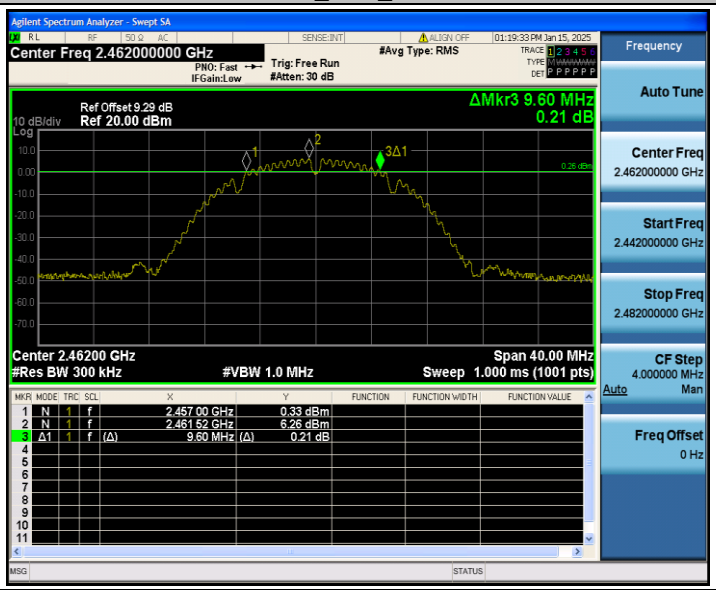
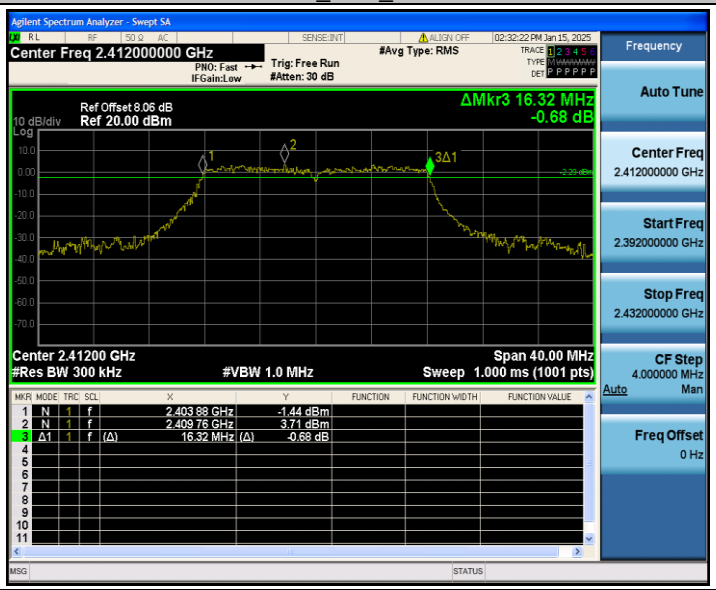

11G_Ant1_2412

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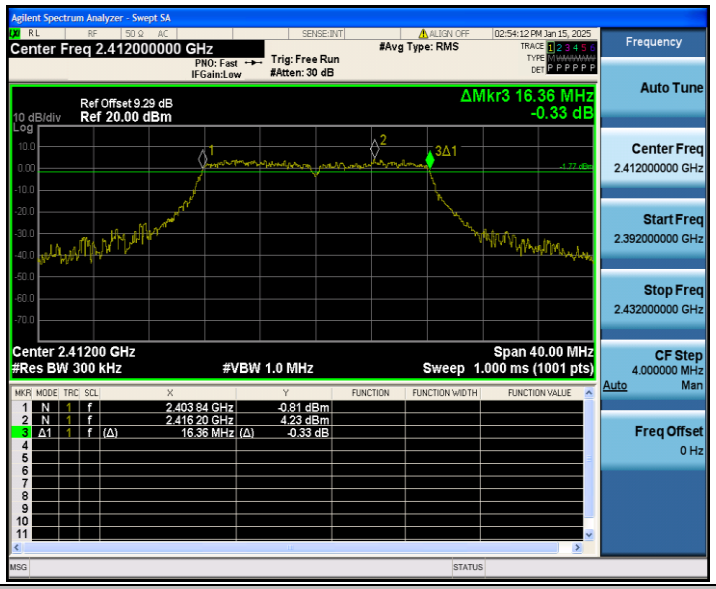
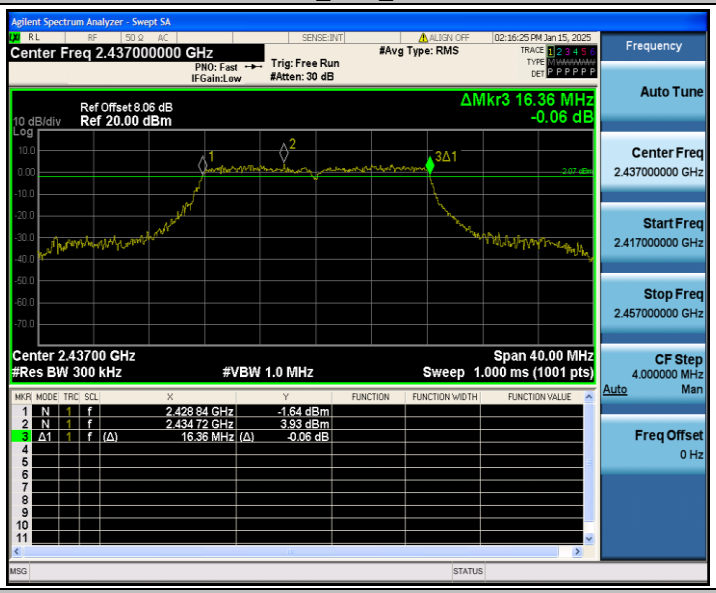
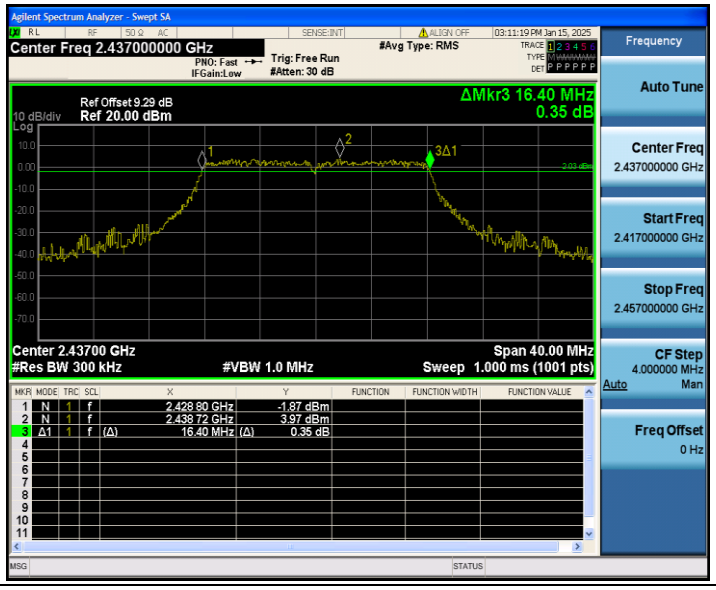


11G_Ant1_2437



11G_Ant2_2437



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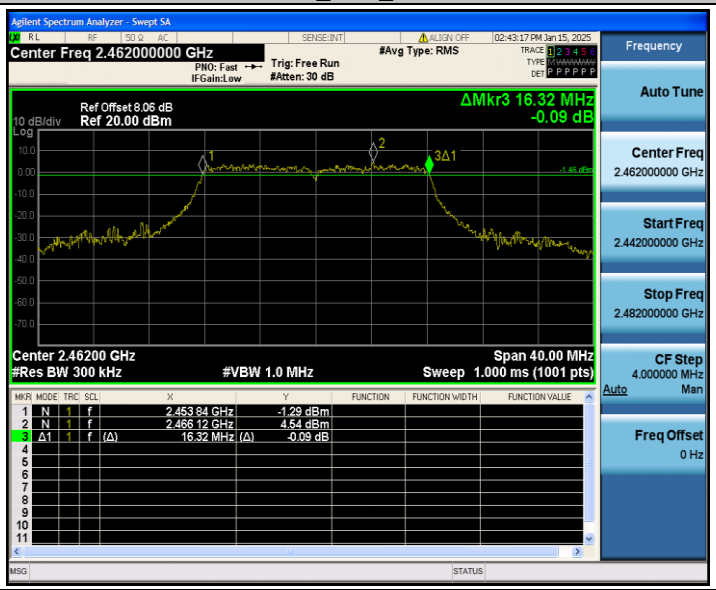
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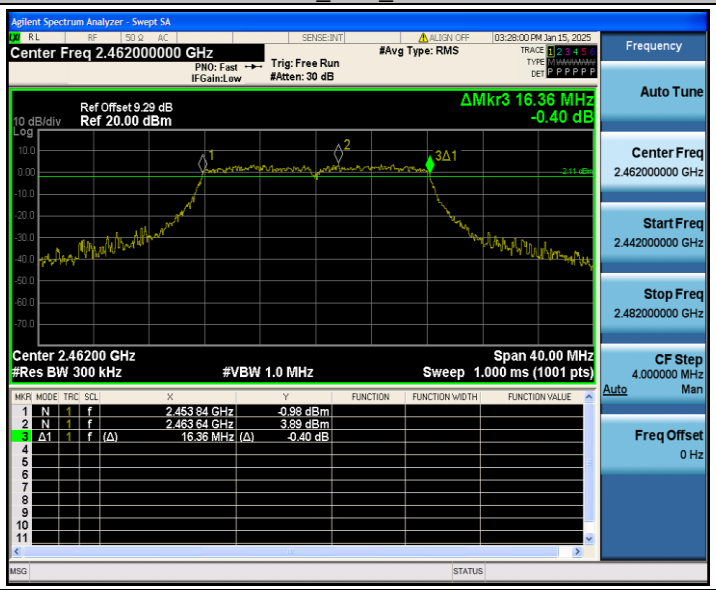
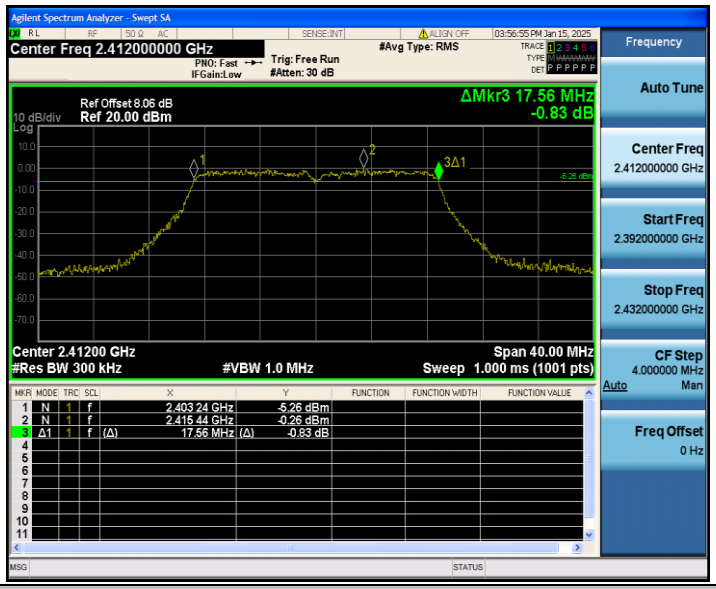
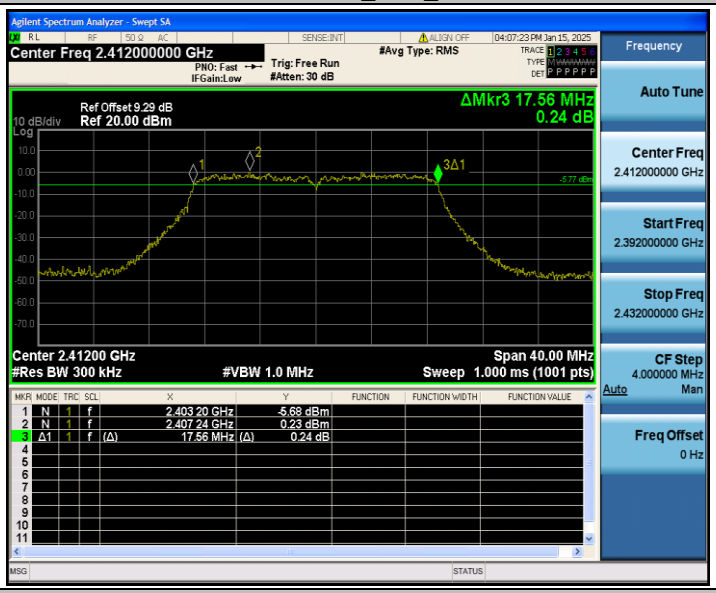

11N20MIMO_Ant1_2412



11N20MIMO_Ant2_2412



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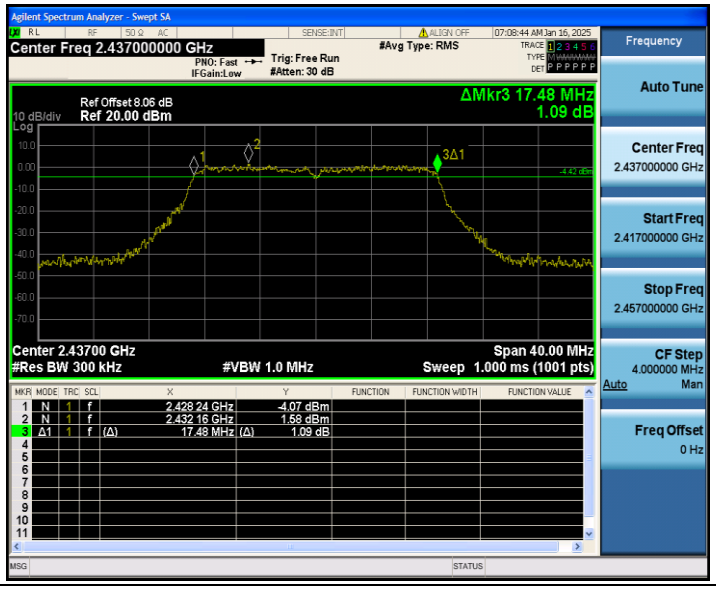
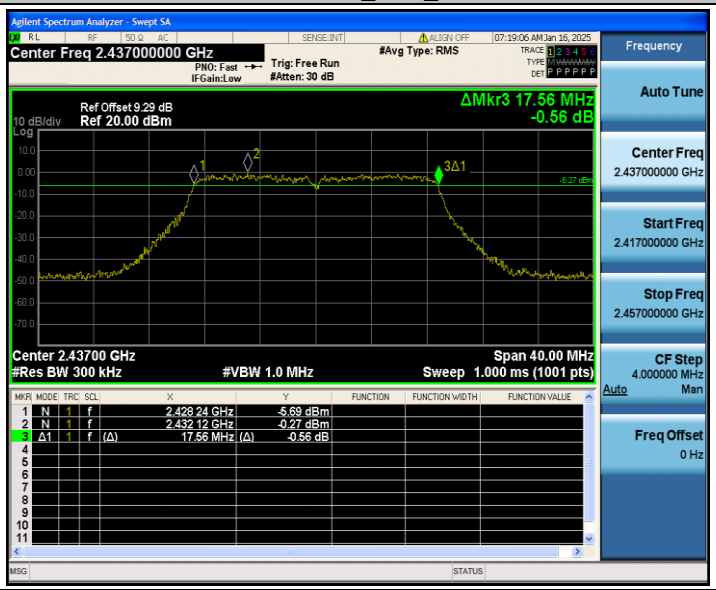
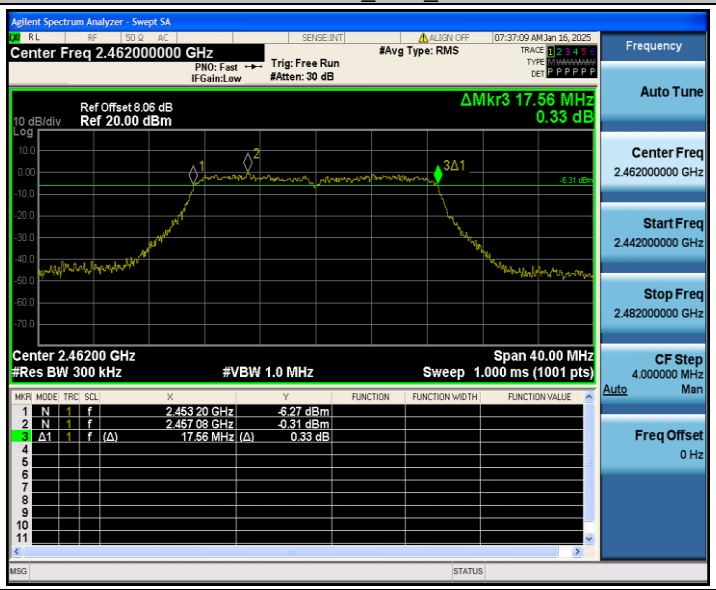
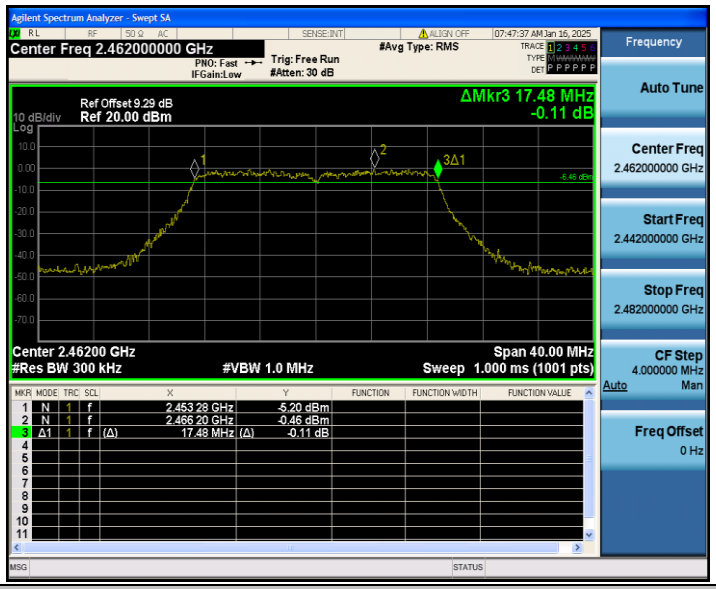
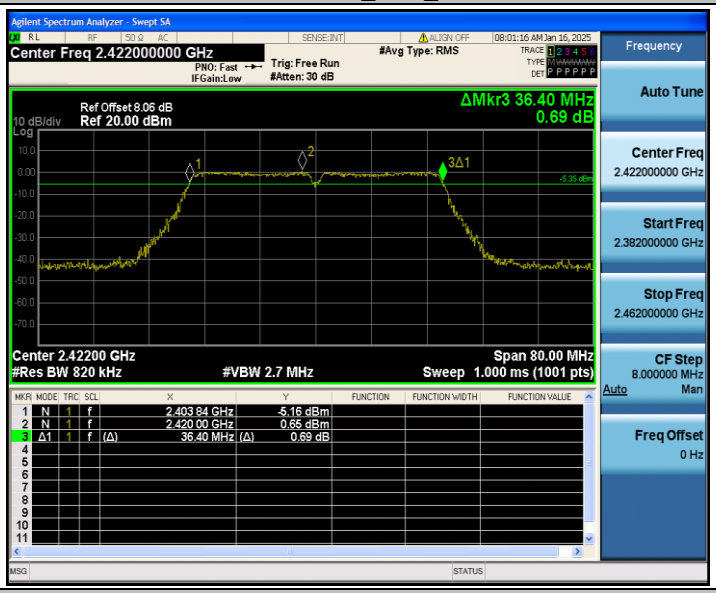


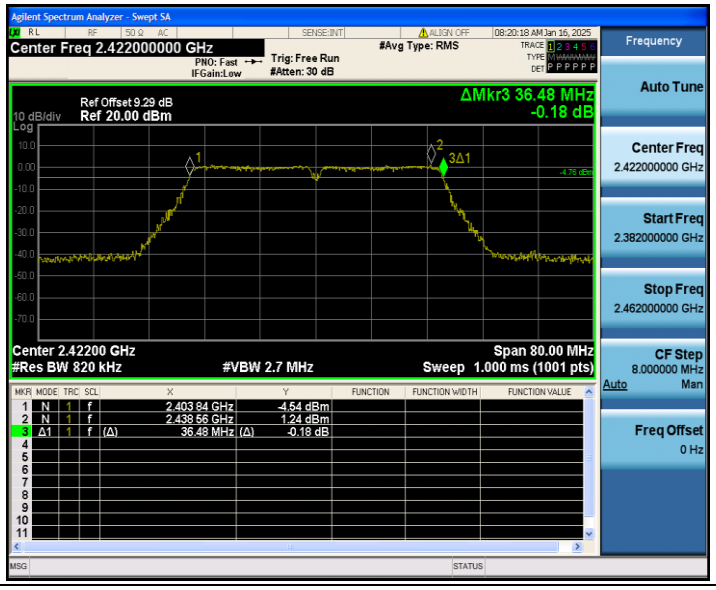
11N20MIMO_Ant2_2437

11N20MIMO_Ant1_2462

11N20MIMO_Ant2_2462

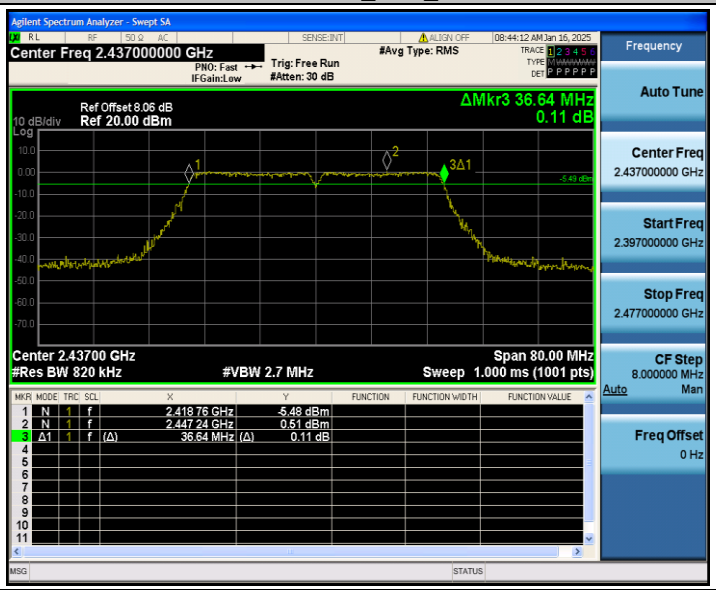


11N40MIMO_Ant1_2422



11N40MIMO_Ant2_2422



11N40MIMO_Ant1_2437

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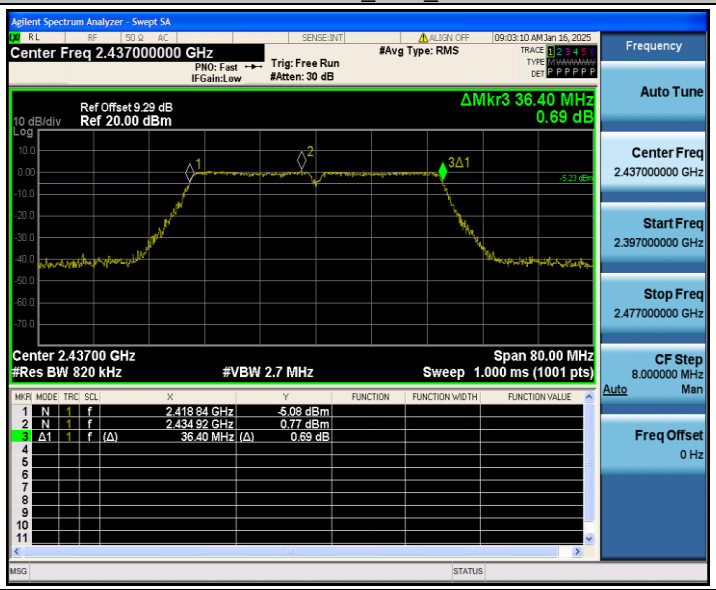
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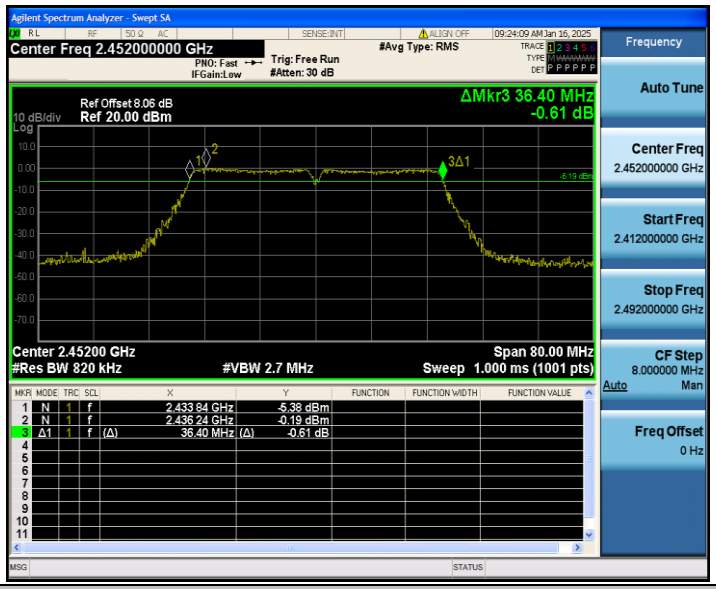
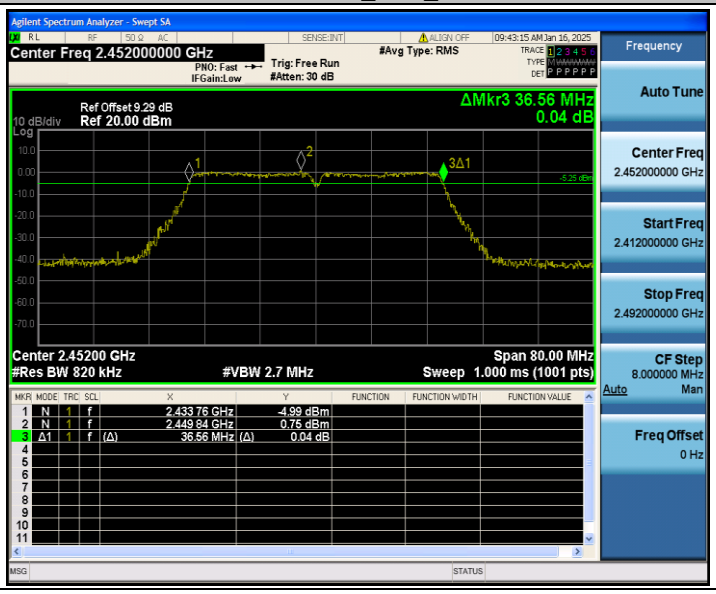


11N40MIMO_Ant2_2452



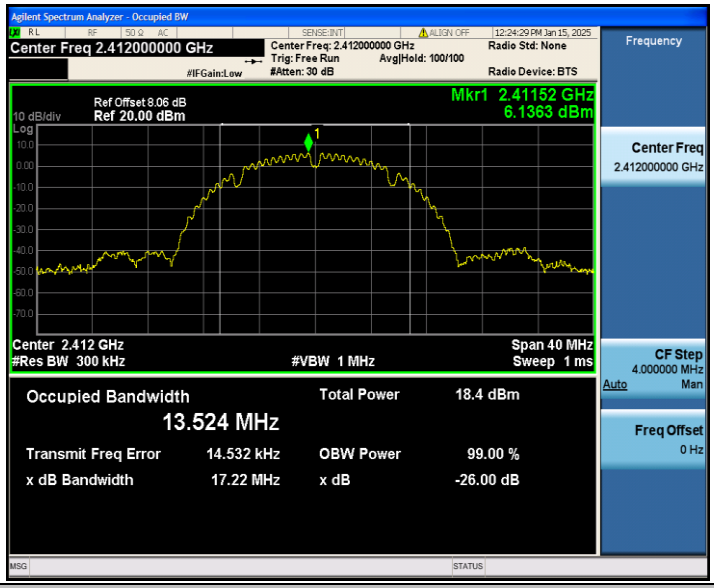
10.2 Appendix B: Occupied Channel Bandwidth

10.2.1 Test Result

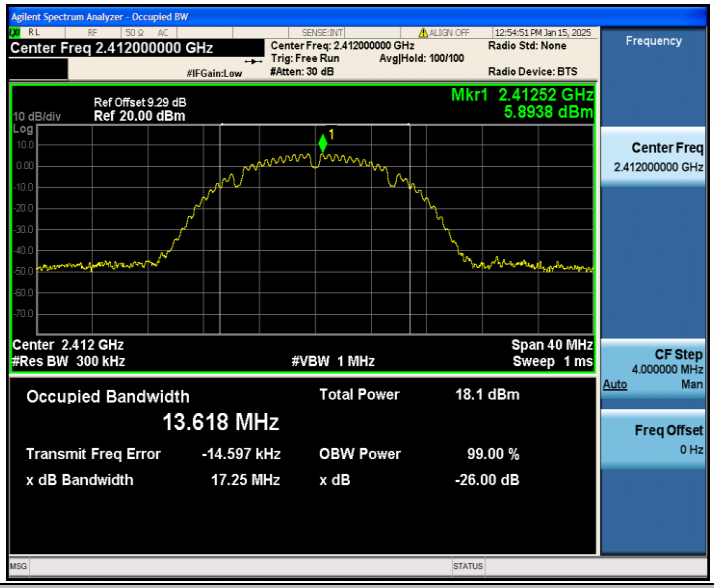
Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.524	2405.2525	2418.7765	---	---
	Ant2	2412	13.618	2405.1764	2418.7944	---	---
	Ant1	2437	13.545	2430.2452	2443.7902	---	---
	Ant2	2437	13.638	2430.1622	2443.8002	---	---
	Ant1	2462	13.573	2455.1873	2468.7603	---	---
	Ant2	2462	13.723	2455.0786	2468.8016	---	---
11G	Ant1	2412	16.731	2403.5719	2420.3029	---	---
	Ant2	2412	16.703	2403.6235	2420.3265	---	---
	Ant1	2437	16.600	2428.6986	2445.2986	---	---
	Ant2	2437	16.661	2428.6723	2445.3333	---	---
	Ant1	2462	16.706	2453.5964	2470.3024	---	---
	Ant2	2462	16.628	2453.6589	2470.2869	---	---
11N20MIMO	Ant1	2412	17.743	2403.1079	2420.8509	---	---
	Ant2	2412	17.729	2403.1229	2420.8519	---	---
	Ant1	2437	17.740	2428.1083	2445.8483	---	---
	Ant2	2437	17.738	2428.1152	2445.8532	---	---
	Ant1	2462	17.729	2453.1131	2470.8421	---	---
	Ant2	2462	17.734	2453.1213	2470.8553	---	---
11N40MIMO	Ant1	2422	36.729	2403.6123	2440.3413	---	---
	Ant2	2422	36.801	2403.6136	2440.4146	---	---
	Ant1	2437	36.831	2418.5590	2455.3900	---	---
	Ant2	2437	36.758	2418.5847	2455.3427	---	---
	Ant1	2452	36.791	2433.6486	2470.4396	---	---
	Ant2	2452	36.781	2433.6580	2470.4390	---	---

10.2.2 Test Graphs

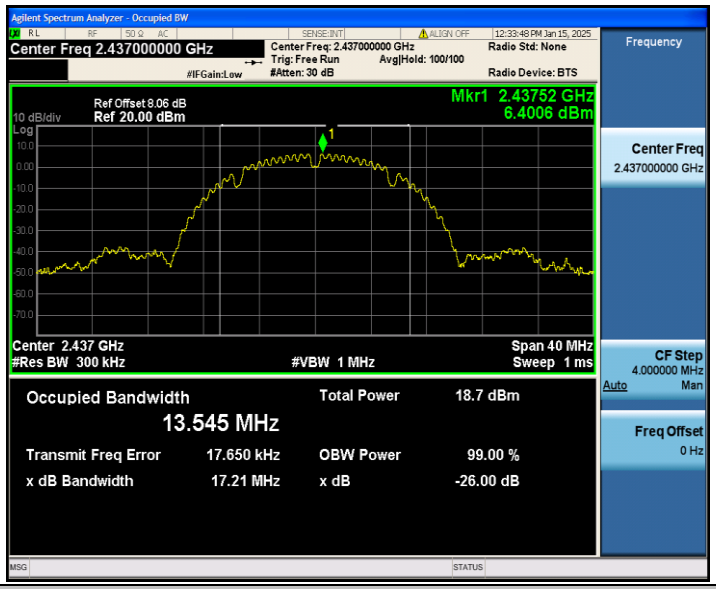
11B_Ant1_2412



11B_Ant2_2412

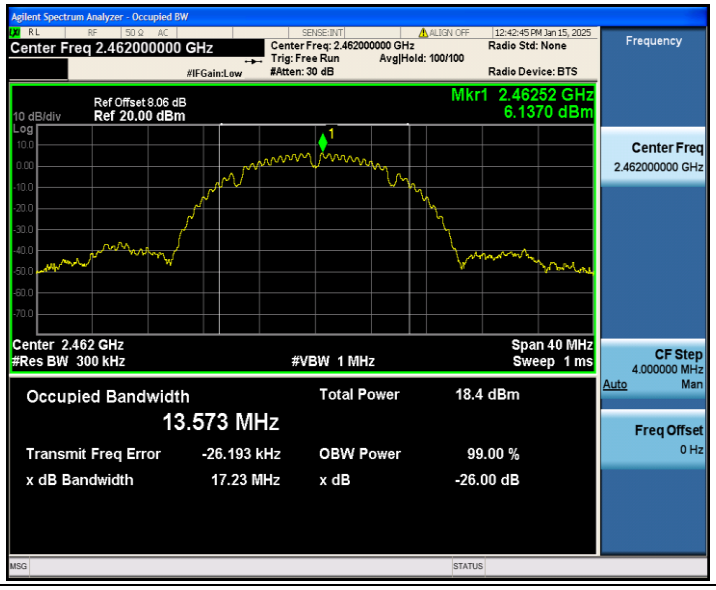


11B_Ant1_2437



11B_Ant2_2437

11B_Ant1_2462



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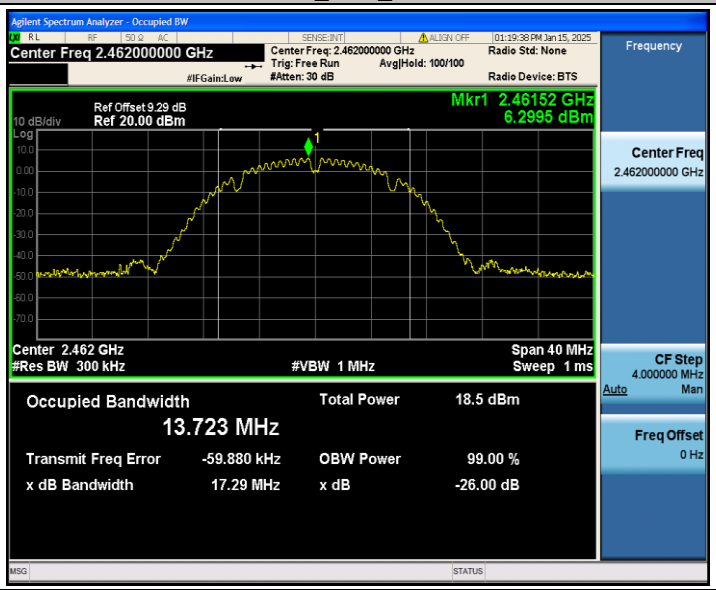
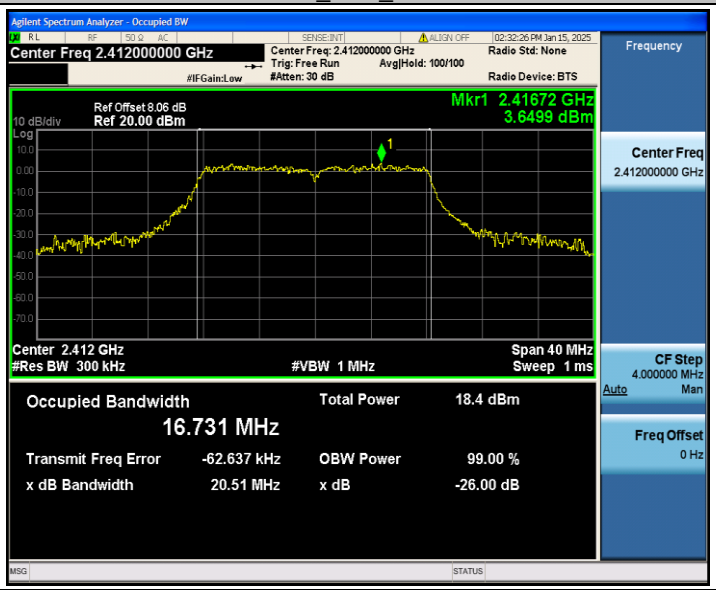
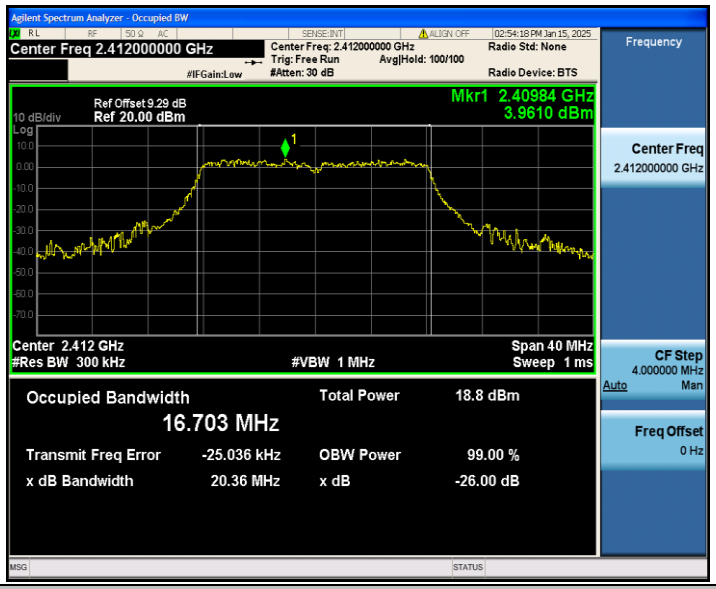
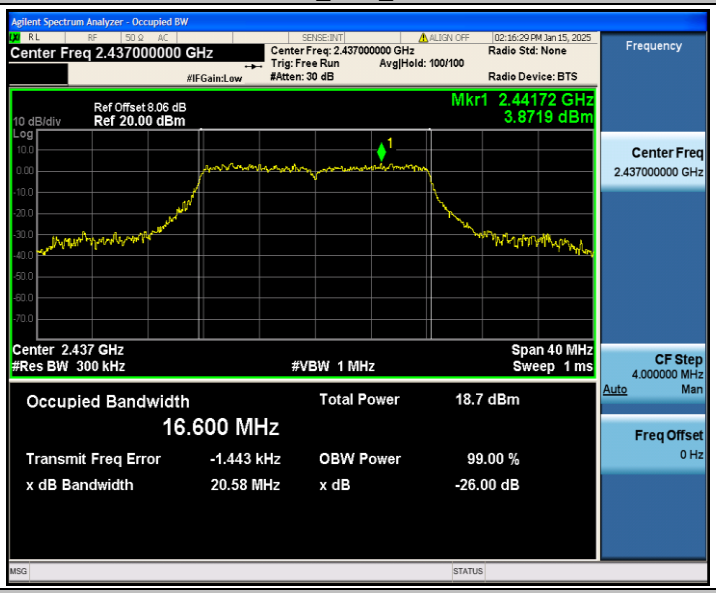
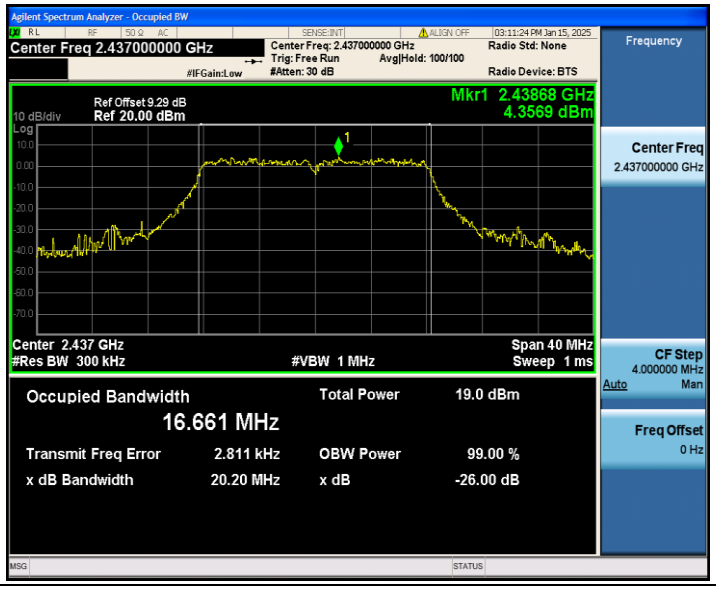

11G_Ant1_2412

11G_Ant2_2412

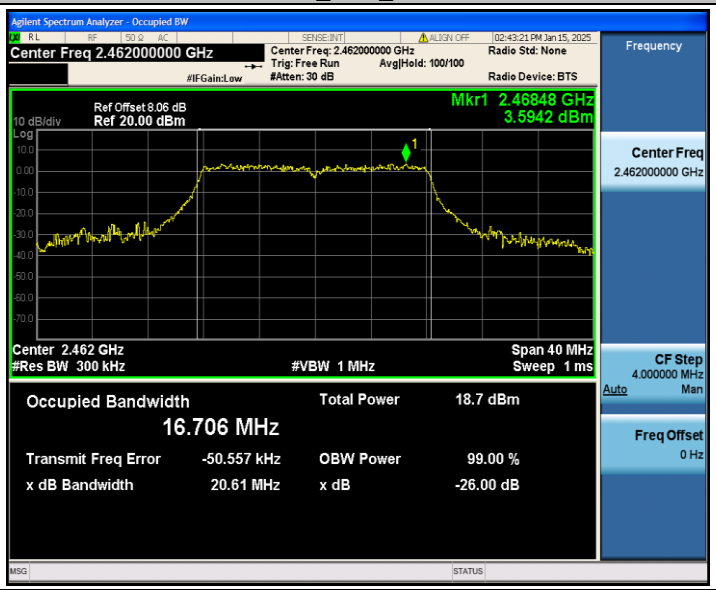
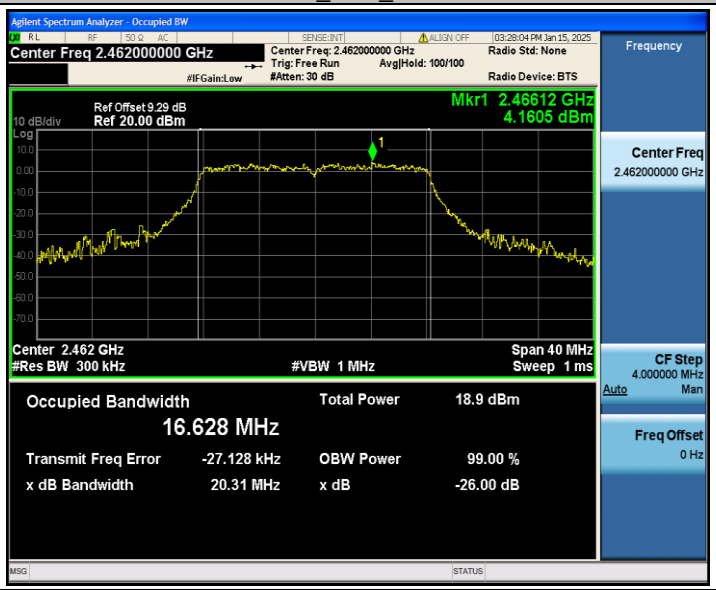


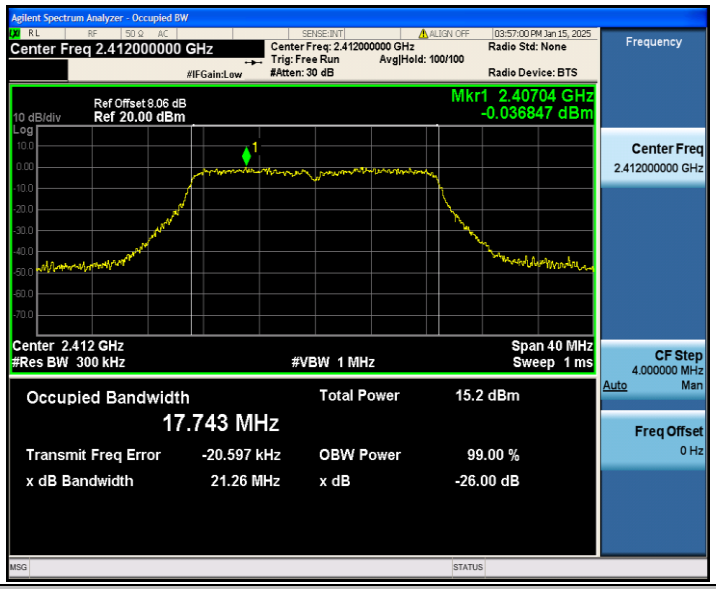
11G_Ant1_2437



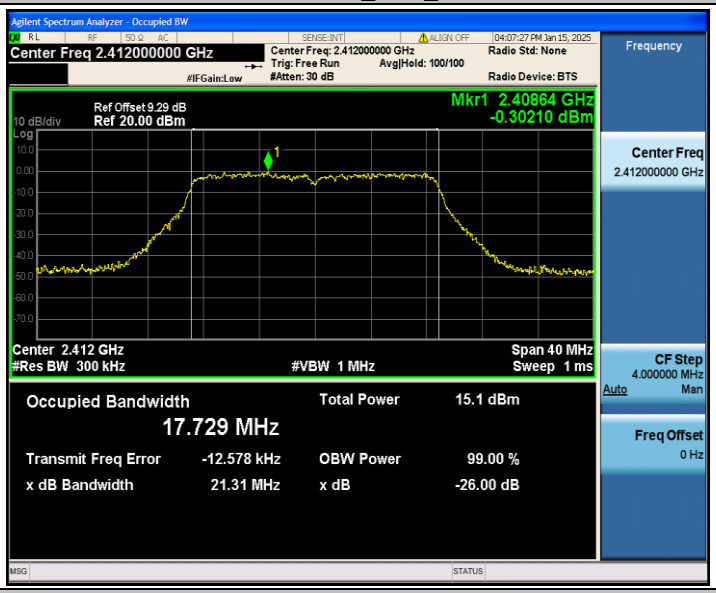
11G_Ant2_2437



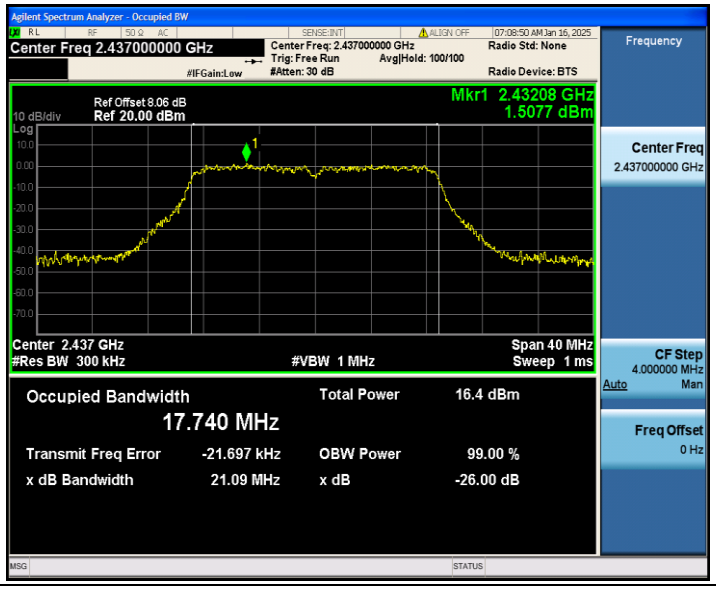
11G_Ant1_2462

11G_Ant2_2462

11N20MIMO_Ant1_2412



11N20MIMO_Ant2_2412



11N20MIMO_Ant1_2437



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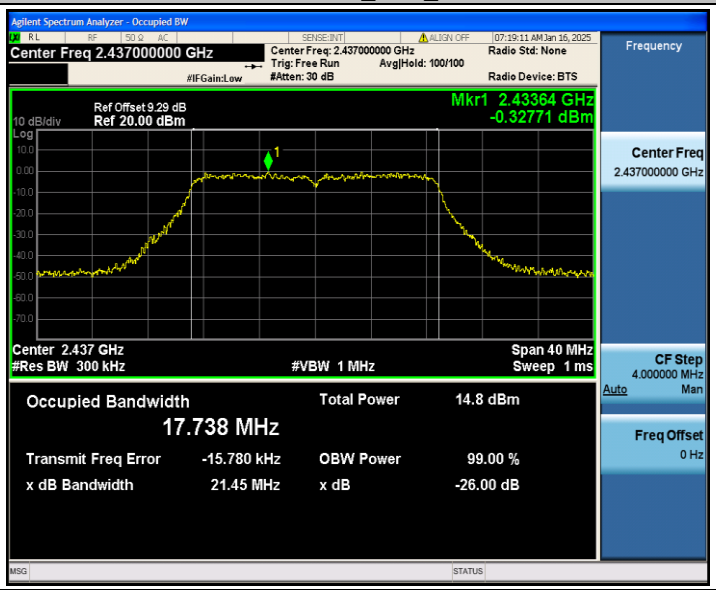
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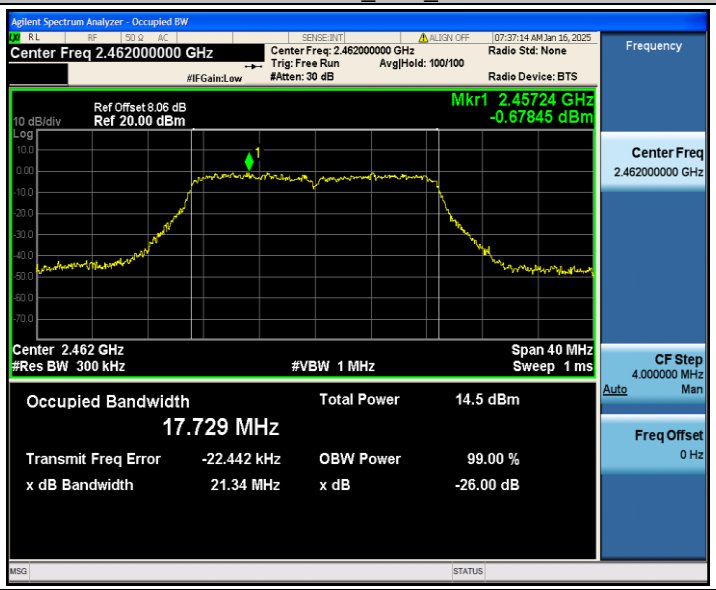
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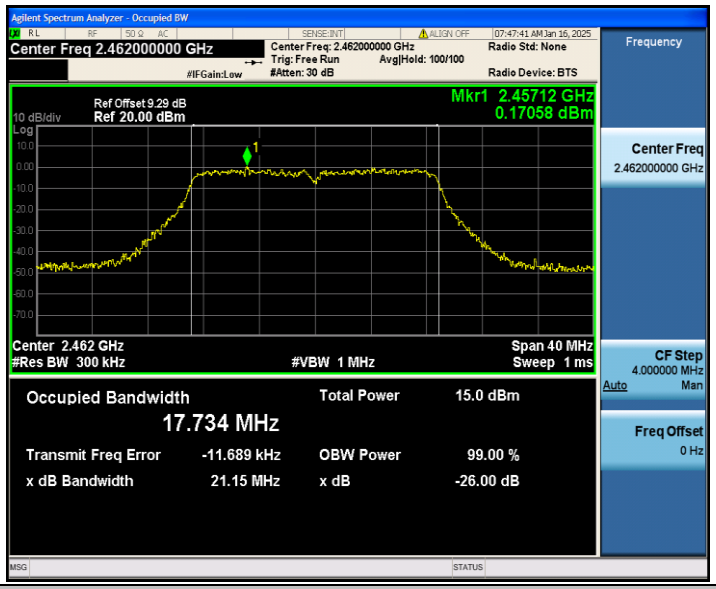

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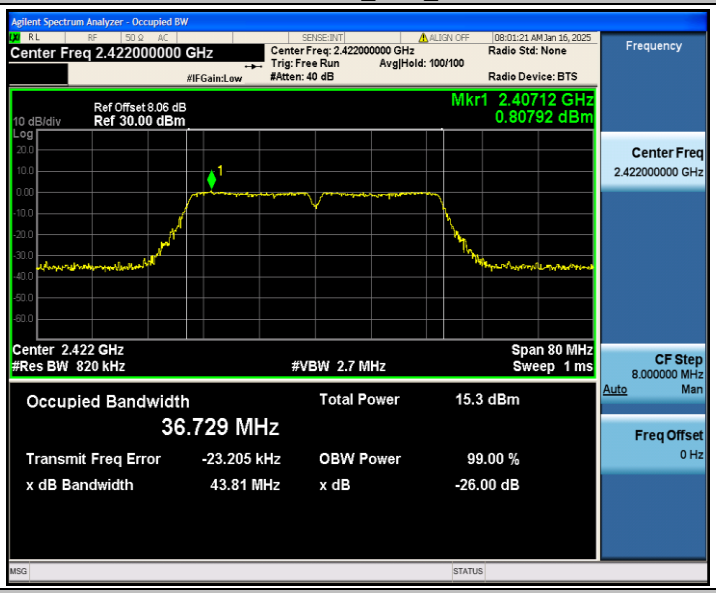

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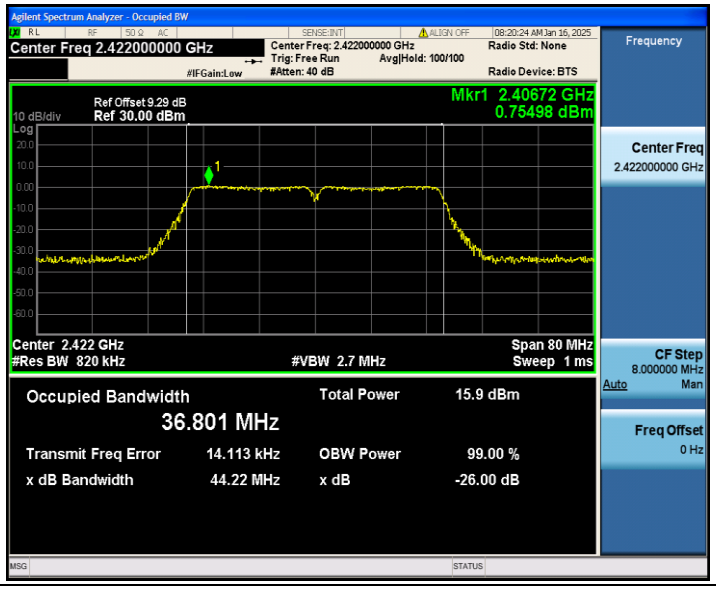

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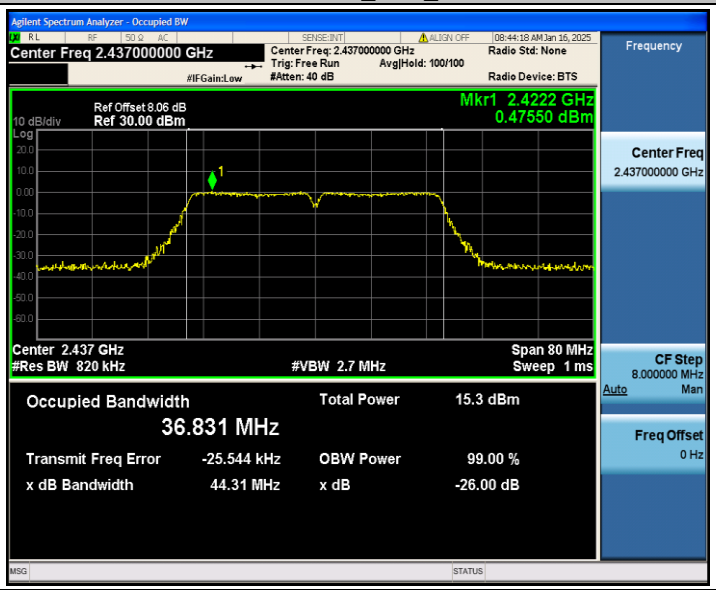
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11N40MIMO_Ant1_2452