



Test report No:
2510795R.701A

FCC TEST REPORT

Product Name	IEEE 802.11 a/b/g/n/ac/ax 2T/2R Band USB2.0 Combo Module Integrated Bluetooth V2.1/3.0/4.0/4.1/4.2/5.2
Model and /or type reference	WXT04R2111
Trademark	
FCC ID	2A769-WXT04R2111
Applicant's name / address	K-tronics(SuZhou)Technology Co.,LTD No.1088, Dajing Road,Economic and Technological Development Zone,Wujiang District, Suzhou, Jiangsu Province, 215200, P.R. C hina
Test method requested, standard	47 CFR FCC Part 15 (Section 15.247) ANSI C63.10: 2013
Verdict Summary	IN COMPLIANCE
Tested By (name / position & signature)	Jun Xu/Project Engineer 
Approved by (name / position & signature)	Frank He/ Technical Manager 
Date of issue	2025-05-22
Report Version	V1.0
Report template No	Template_FCC Part 15C-RF-V1.0

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

GENERAL CONDITIONS

Test Location A	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Test Location B	No. 8213, Fanhua Avenue, Baohe District, Hefei City, Anhui Province, China
Date(receive sample)	Feb. 10, 2025
Date (start test)	Feb. 15, 2025
Date (finish test)	Apr. 15, 2025
Note: Radiated Emission and Radiated Emission Band Edge were completed at Test Location B, and other tests were completed at Test Location A.	

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
T_x	: Transmitter
R_x	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
2510795R.701A	V1.0	Initial issue of report.	2025-05-22

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with 47 CFR FCC Part 15 (Section 15.247).
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
 - Chapter 1.1 General Description of the Item(s);
 - Chapter 1.2 Channel List;

USED EQUIPMENT

Test Location A :Conducted Test/ TR8

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Versiom	Software version
Wireless Connectivity Tester	R&S	CMW 270	102593	2024.05.15	2025.05.14	V 4.0.60	N/A
Coaxial Cable	N/A	N/A	2477	2024.06.11	2025.06.10	N/A	N/A
Coaxial Cable	N/A	N/A	2478	2024.06.11	2025.06.10	N/A	N/A
High and low temperature and fast temperature change test box	ASTUOD	ASTD-FBT-225K	N/A	2024.04.21	2025.04.20	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	RF07	2024.07.04	2025.07.03	N/A	N/A

Test system

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Versiom	Software version
MAX Signal Analyzer	Keysight	N9010A	MY48030494	2024.10.26	2025.10.25	A.14.03	N/A
RF Control Unit	Tonscend	JS0806-2	22G8060594	2025.01.26	2026.01.25	N/A	N/A
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY61252529	2024.05.12	2025.05.11	B.01.96	N/A
Frequency extender for EXG or MXG	Keysight	N5182BX07	MY59362500	2024.05.12	2025.05.11	N/A	N/A
EXG-B MW Analog Signal Generator	Keysight	N5173B	MY61252566	2024.07.06	2025.07.05	B.01.95	N/A
Test Software	Tonscend	TS1120	JS1120-3	N/A	N/A	N/A	V3.0.22

Test Location A :Radiated Emission(9KHz-1GHz) / AC2

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Versiom	Software version
EMI Test Receiver	R&S	ESCI	100176	2024.05.12	2025.05.11	4.42 SP3	N/A
Loop Antenna	SCHWARZBECK	FMZB 1513-60 B	00027	2024.05.28	2025.05.27	N/A	N/A
Bilog Antenna	Teseq GmbH	CBL6112D	27613	2024.09.08	2025.09.07	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	AC2-TH	2024.07.04	2025.07.03	N/A	N/A
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2024.04.27	2025.04.26	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	N/A	N/A	3

Test Location A: Radiated Emission (1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Version	Software version
EXA Spectrum Analyzer	Keysight	N9020B	MY60112218	2024.11.02	2025.11.01	A.31.05	N/A
Pre-Amplifier	SKET	LNPA_0118 G-45	SK2021090101	2024.04.27	2025.04.26	N/A	N/A
Preamplifier	CHENGYI	EMC184045 SE	980263	2024.07.06	2025.07.05	N/A	N/A
DRG Horn	ETS-Lindgren	3117	00167055	2024.08.29	2025.08.28	N/A	N/A
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2024.05.30	2025.05.29	N/A	N/A
Filter Switch Box	MVE	MSW-F196	C070001S	2024.04.20	2025.04.19	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	THM-024	2024.05.17	2025.05.16	N/A	N/A
Coaxial Cable	ROSENBERGER	LA1-C011-2000/3000	AC5-40G	2025.01.18	2026.01.17	N/A	N/A
Coaxial Cable	ROSENBERGER	LA1-C011-2000/3000	AC5-40G-2	2024.05.26	2025.05.25	N/A	N/A
Cable	Rosenberger	LA1-C011-1000	0523	2024.05.26	2025.05.25	N/A	N/A
Dekra test software	Dekra	N/A	N/A	N/A	N/A	N/A	3

Test Location B: Radiated Emission Band Edge / AC103

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date	Firmware Version	Software version
Signal analyzer	keysight	N9020B	MY63490118	2024.07.26	2025.07.25	A 08.54	N/A
Bilog Antenna	TESEQ	CBL6112D	64164	2024.11.23	2025.11.22	N/A	N/A
Horn Antenna	RF SPIN	DRH18-E	KV2D11A18ES	2024.11.02	2025.11.01	N/A	N/A
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	01312	2024.10.28	2025.10.27	N/A	N/A
Amplifier	ESE	LNA0118	LNA23100009	2024.08.10	2025.08.09	N/A	N/A
Amplifier	Tonscend	TAP01018048S	AP23J8060307	2024.11.16	2025.11.15	N/A	N/A
Band Reject Filter Group	Tonscend	JS0806-F	23G806F0701	2024.11.20	2025.11.19	N/A	N/A
Temperature/Humidity Meter	RTS	RTS-8S	026	2024.09.04	2025.09.03	N/A	N/A
Test Software	Tonscend	JS36	N/A	N/A	N/A	N/A	5.0.0

UNCERTAINTY

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Test item Test Location A	Uncertainty
AC Power Line Conducted Emission	± 2.92 dB
Peak Power Output	± 1.13 dB
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 4.60 dB 200MHz~1GHz: 4.10 dB Vertical: 30MHz~200MHz: 4.80 dB 200MHz~1GHz: 4.10 dB
Radiated Emission(1GHz~40GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB Horizontal: 18GHz~40GHz: 4.70 dB Vertical: 18GHz~40GHz: 4.60 dB
RF antenna conducted test	± 1.13 dB
Radiated Emission Band Edge	± 5.00 dB
DTS Bandwidth	± 279 Hz
Occupied Bandwidth	± 279 Hz
Power Density	± 1.13 dB

Test item Test Location B	Uncertainty
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 4.86 dB 300MHz~1GHz: 4.86 dB Vertical: 30MHz~200MHz: 4.92 dB 300MHz~1GHz: 4.92 dB
Radiated Emission(1GHz~40GHz)	Horizontal: 1GHz~18GHz: 5.99 dB Vertical: 1GHz~18GHz: 5.76 dB Horizontal: 18GHz~40GHz: 5.99 dB Vertical: 18GHz~40GHz: 5.76 dB
Radiated Emission Band Edge	± 5.99 dB

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name:	IEEE 802.11 a/b/g/n/ac/ax 2T/2R Band USB2.0 Combo Module Integrated Bluetooth V2.1/3.0/4.0/4.1/4.2/5.2				
Trademark:					
Model No.:	WXT04R2111				
Hardware Version:	N/A				
Software Version:	N/A				
Power Supply:	3.3 Vdc				
Manufacturer:	HUIZHOU GAOSHENGDA TECHNOLOGY CO.,LTD				
Manufacturer address:	No.2 Jinda Road, Sandong Town, HUIZHOU, CHINA				
Wireless specification:	802.11b/g/n/ax				
Operating frequency range(s) :	802.11b/g/n/ax(20MHz): 2412~2462MHz 802.11n/ax(40MHz): 2422~2452MHz				
Type of Modulation:	802.11b:	DSSS(DBPSK, DQPSK, CCK)			
	802.11g:	OFDM(BPSK, QPSK, 16QAM, 64QAM)			
	802.11n:	OFDM(BPSK, QPSK, 16QAM, 64QAM)			
	802.11ax:	OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)			
Antenna Type:	External: Dipole Antenna				
Antenna Delivery:	☒	1TX + 1RX	☒	2TX + 2RX	☐ Others:
Antenna technology:	☒	SISO			
	☒	MIMO	☒	CDD	☐ Beam-forming
			☐	Others:	
Antenna Gain(dBi):	For Power	SISO: Ant1:4.30; Ant2:4.30			
		CDD: 4.30			
	For PSD	SISO: 4.30			
		CDD: 7.31			
Note: The customer stated that OFDMA only supports Full RU.					

1.2 Channel List

IEEE 802.11b/g & IEEE 802.11n/ax (20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412 MHz	2	2417 MHz	3	2422 MHz	4	2427 MHz
5	2432 MHz	6	2437 MHz	7	2442 MHz	8	2447 MHz
9	2452 MHz	10	2457 MHz	11	2462 MHz	-	-
IEEE 802.11n/ax(40MHz)Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
3	2422 MHz	4	2427 MHz	5	2432 MHz	6	2437 MHz
7	2442 MHz	8	2447 MHz	9	2452 MHz	-	-

Note: The General Description of the Item, Channel List in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Auxiliary equipment / Test software for the EUT

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
(1) Notebook	Think pad x220	Lenovo	Adapter
(2) USB Control Cable	N/A	N/A	N/A
(3) USB Control Cable	N/A	N/A	N/A
software	Type / Version	Manufacturer	Supplied by
MP Tool	N/A	N/A	N/A

Accessories Information	Cable		
	Length used during test [m]	Attached during test	Shielded
(2)USB Control Cable	1	☒	☒
(3)USB Control Cable	8	☒	☒

2.2 Testing process

1	Execute the [MP Tool] on the notebook.
2	Configure the test mode, the test channel, and the data rate.
3	Verify that the EUT works properly.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15 Subpart C Section 15.247	2024	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074 D01V05r02	2019	Guidance for performing compliance measurements on Digital Transmission System (DTS) operating under section 15.247
KDB 662911	2020	Provision to Allow Measurement of Directional Gain of Multi-Antenna Systems for Compliance Verification

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

(Please define the deviations from the standard(s) if applicable)

3.3 Overview of results

Test Item	Standard(s)	Verdict	Remark
DTS Bandwidth	FCC 15.247(a)(2)	PASS	Test data please refer to Appendix A
Maximum conducted output power	15.247 (b)(3)	PASS	Test data please refer to Appendix B
Maximum power spectral density	FCC 15.247(e)	PASS	Test data please refer to Appendix C
Band edge measurements	FCC 15.247(d) FCC 15.205 FCC 15.209	PASS	Test data please refer to Appendix D
Conducted Spurious Emission	FCC 15.247(d), FCC 15.209	PASS	Test data please refer to Appendix E
Duty cycle	ANSI C63.10:2013	PASS	Test data please refer to Appendix F
Emissions in Restricted Bands	FCC 15.205 FCC 15.209	PASS	Test data please refer to Appendix G
AC Power Line Conducted Emission	FCC 15.207	N/A	EUT is not applicable for DC power supply.
Antenna Requirement	FCC 15.203	PASS	---

3.4 Power setting in test

Mode	Channel	Frequency (MHz)	Power setting		
			ANT1	ANT2	ANT1+2
802.11b	01	2412	20	20	N/A
	06	2437	20	20	N/A
	11	2462	22	22	N/A
802.11g	01	2412	19	19	N/A
	06	2437	19	19	N/A
	11	2462	20	20	N/A
802.11n(20MHz)	01	2412	19	19	16
	06	2437	19	19	16
	11	2462	19	19	16
802.11n(40MHz)	03	2422	19	19	16
	06	2437	19	19	16
	09	2452	17	17	14
802.11ax(20MHz)	01	2412	19	19	16
	06	2437	19	19	16
	11	2462	19	19	16
802.11ax(40MHz)	03	2422	19	19	16
	06	2437	19	19	16
	09	2452	17	17	14

3.5 Test Matrix

Test item	Model: WXT04R2111	
	1(#1)	2(#2)
DTS Bandwidth	☒	☐
Occupied Channel Bandwidth	☒	☐
Maximum conducted output power	☒	☐
Maximum power spectral density	☒	☐
Band edge measurements	☐	☒
Conducted Spurious Emission	☒	☐
Duty cycle	☒	☐
Emissions in Restricted Bands	☐	☒
Note1: The only difference between sample #1 and sample #2 is whether to keep the original antenna, sample #1 is a conduction test product that removes the original antenna and is equipped with SMA wires, and sample #2 is a complete product that retains the original antenna.		

3.6 Test Facility

Tset Location A : FCC Designation Number: CN1199

Tset Location B : FCC Designation Number: CN1321

4 TEST RESULTS

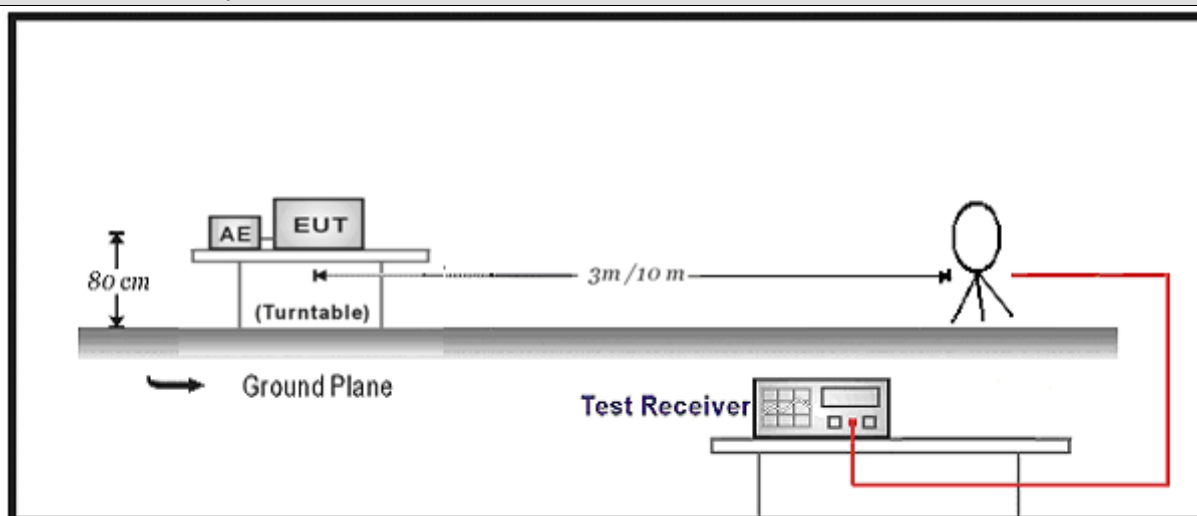
4.1 Emissions in restricted frequency bands	VERDICT: PASS
--	----------------------

4.1.1 Limit			
Standard		FCC Part 15 Subpart C Paragraph 15.205; 15.209	
Restricted Bands of operation for FCC			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 –16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975–12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675–12.57725	322 – 335.4	3600 – 4400	Above 38.6
13.36 – 13.41	--	--	--
Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 ^(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 ^(Note 1)
1.705 - 30	30	29.5	30 ^(Note 1)
30 - 88	100	40	3 ^(Note 2)
88 - 216	150	43.5	3 ^(Note 2)
216 - 960	200	46	3 ^(Note 2)
Above 960	500	54	3 ^(Note 2)
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).			
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field			

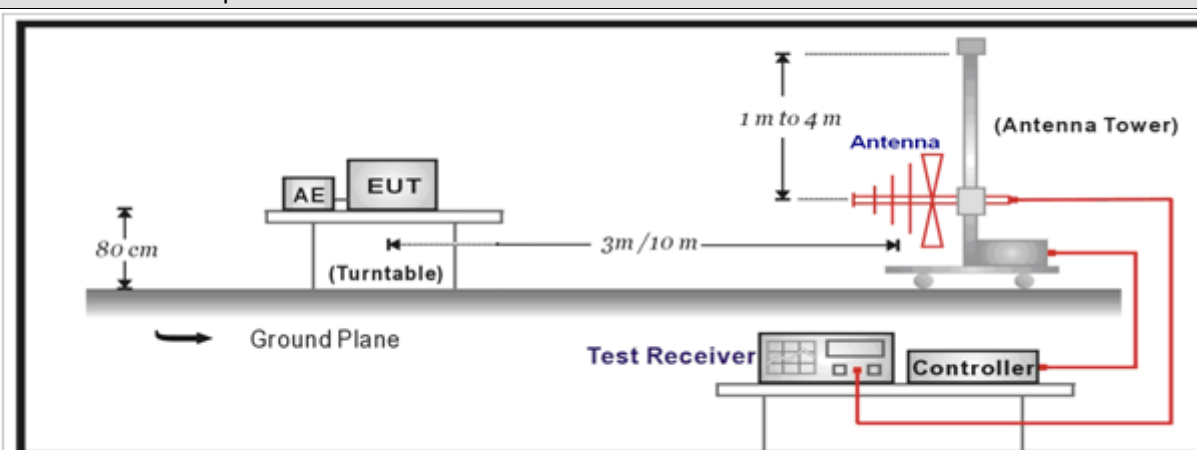
measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.1.2 Test Setup

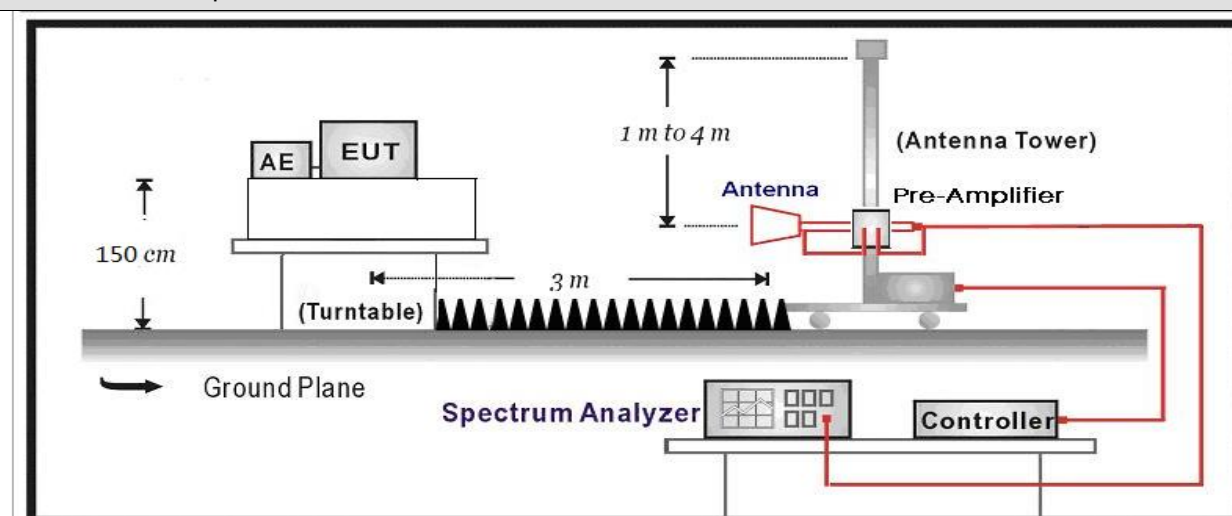
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



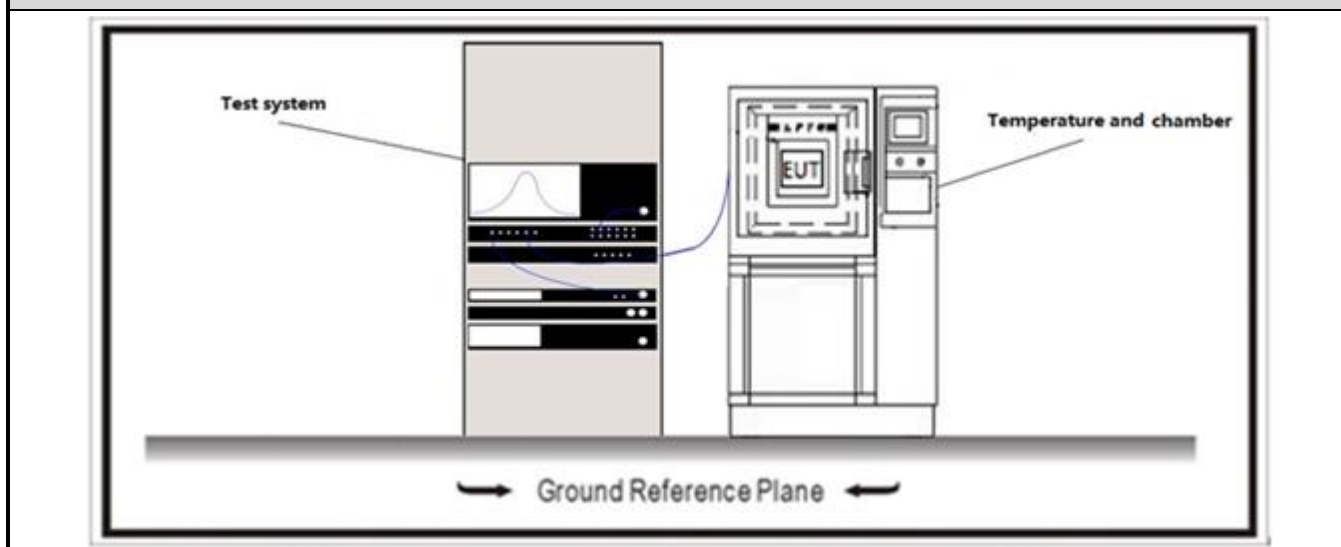
4.1.3 Test Procedure				
	References Rule		Chapter	Description
☒	ANSI C63.10		11.12	Emissions in restricted frequency bands
	☒	ANSI C63.10	11.12.1	Radiated emission measurements
	☒	ANSI C63.10	6.3	Radiated spurious emission test
	☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	☐	ANSI C63.10	11.12.2	Antenna-port conducted measurements
	☐	ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	☐	ANSI C63.10	11.12.2.4	Peak power measurement procedure
	☐	ANSI C63.10	11.12.2.5	Average power measurement procedures
	☐	ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	☐	ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	☐	ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

4.2 Emissions in non-restricted frequency band**VERDICT: PASS****4.2.1 Limit**

Standard	FCC Part 15 Subpart C Paragraph 15.247(d)
RF Output power (Detection methods)	Limit(dB)
RF Output power(Average detector)	30dBc(Note1)
RF Output power(PK detector)	20dBc(Note2)

Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

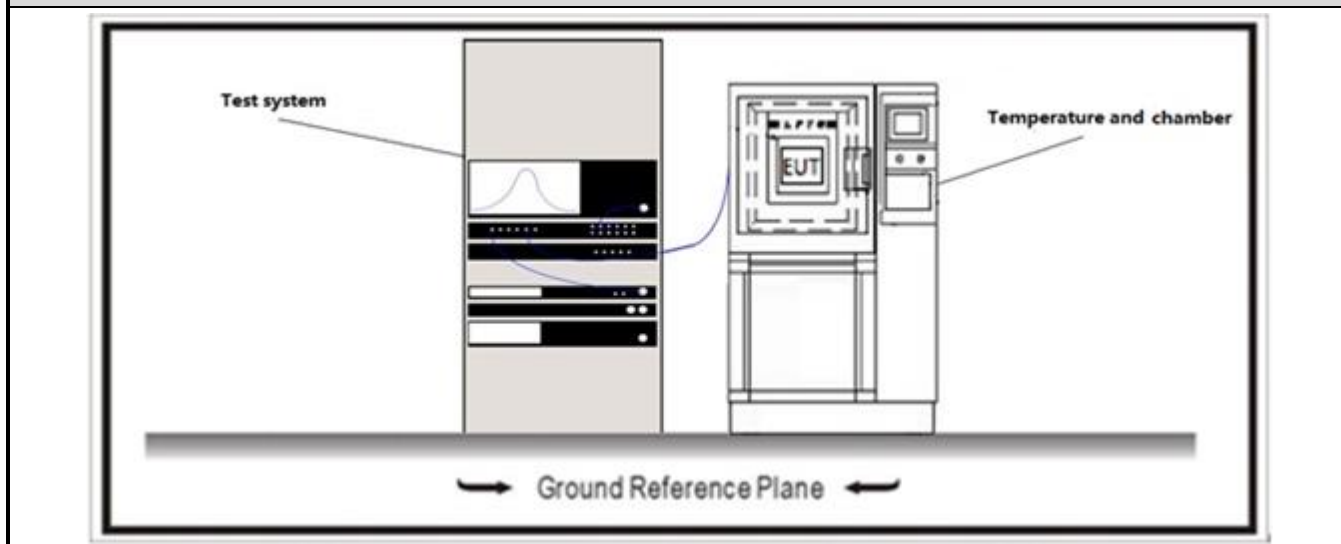
Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

4.2.2 Test Setup**4.2.3 Test Procedure**

References Rule	Chapter	Description
☒ ANSI C63.10	11.11	Emissions in non-restricted frequency bands
☒ ANSI C63.10	11.11.1	General
☒ ANSI C63.10	11.11.2	Reference level measurement
☒ ANSI C63.10	11.11.3	Emission level measurement

4.3 Duty cycle**VERDICT: PASS****4.3.1 Limit**

N/A

4.3.2 Test Setup**4.3.3 Test Procedure**

References Rule	Chapter	Description
☒ ANSI C63.10	11.6	Duty cycle (D), transmission duration (T), and maximum power control level

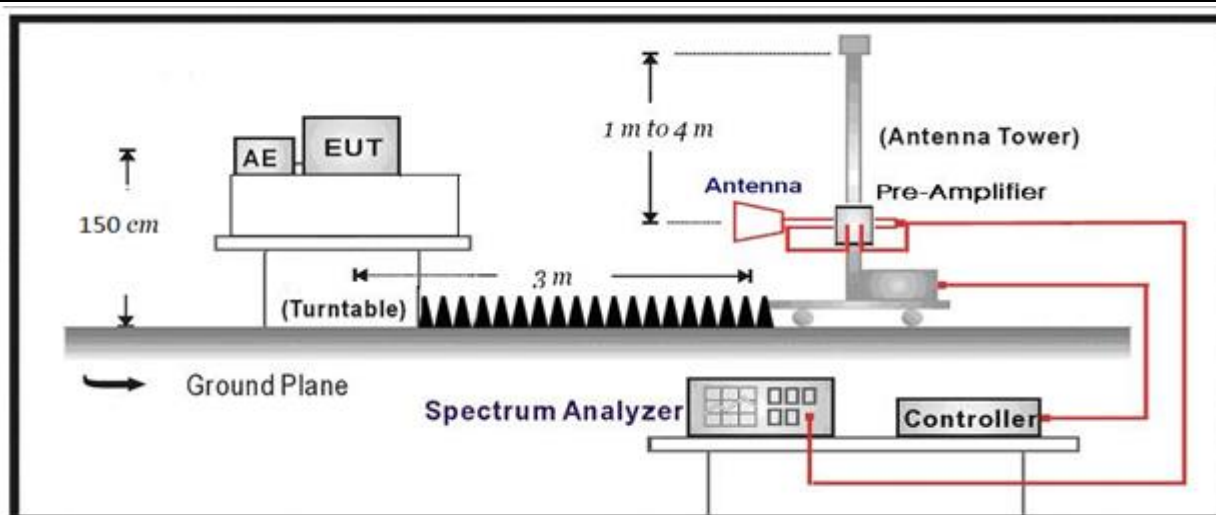
4.4 Radiated Emission Band Edge**VERDICT: PASS****4.4.1 Limit**

Standard		FCC Part 15 Subpart C Paragraph 15.247(d) , 15.205, 15.209		
Frequency bands (MHz)	Detector	Limit (dB μ V/m)	RBW (MHz)	Distance (m)
2310-2390 2483.5-2500	PK	74	1	3
	AV	54	1	3

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

4.4.2 Test Setup

Above 1GHz Test Setup:



4.4.3 Test Procedure			
	References Rule	Chapter	Description
☒	ANSI C63.10	6.10	Band-edge testing
	☒ ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	☐ ANSI C63.10	6.10.6	Marker-delta method
☒	ANSI C63.10	11.12	Emissions in restricted frequency bands
	☒ ANSI C63.10	11.12.1	Radiated emission measurements
	☒ ANSI C63.10	6.3	Radiated spurious emission test
☐	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
☐	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

4.5 DTS Bandwidth	VERDICT: PASS
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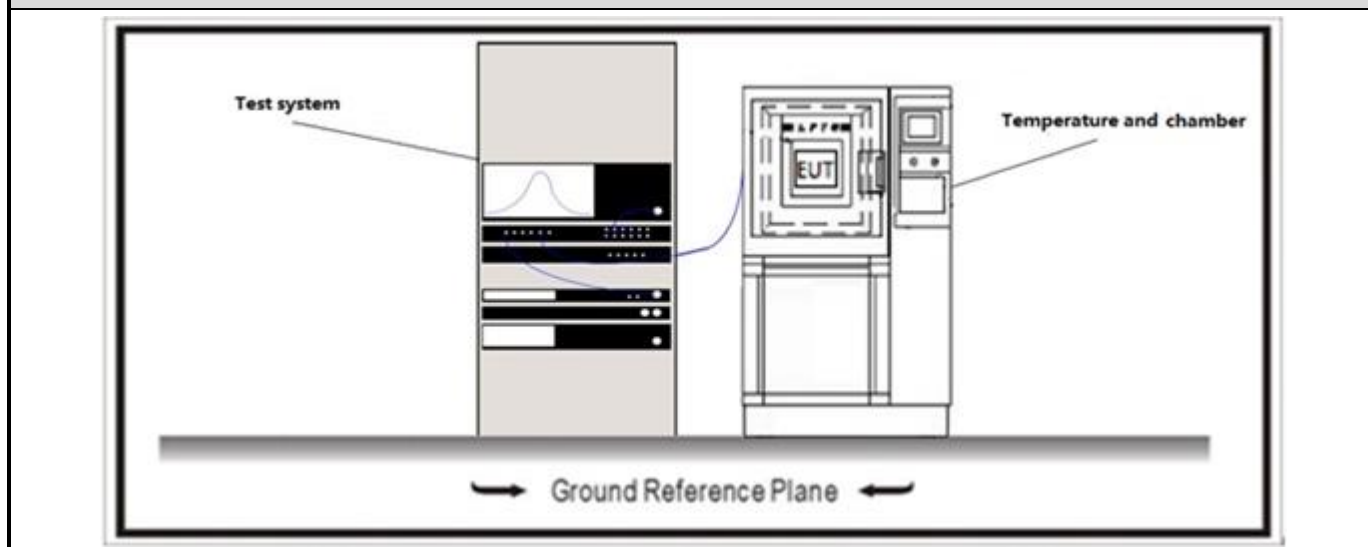
4.5.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247 (a)(2)
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Systems using digital modulation techniques operate in the 2400-2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz

Standard	ANSI C63.10 Paragraph 6.7
-----------------	---------------------------

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs. The occupied bandwidth should be within the required frequency range.

4.5.2 Test Setup**4.5.3 Test Procedure**

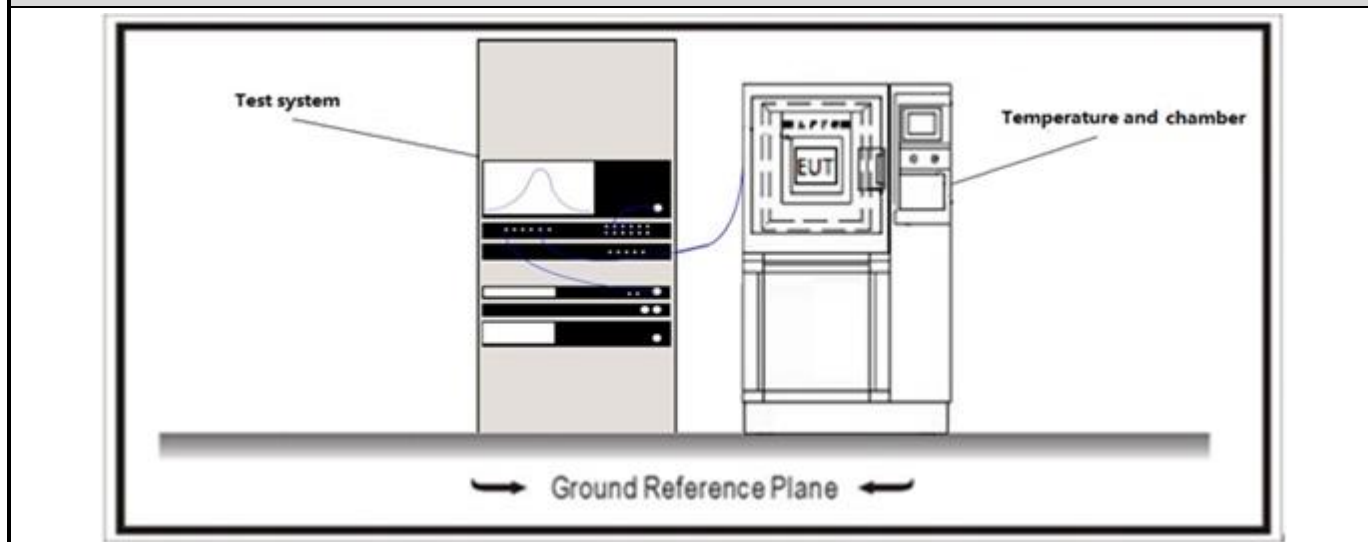
	Reference Rule	Chapter	Description
☒	ANSI C63.10	11.8	DTS bandwidth
☒	ANSI C63.10	11.8.1	Option 1
☐	ANSI C63.10	11.8.2	Option 2
☒	ANSI C63.10	6.9	Occupied bandwidth
☐	ANSI C63.10	6.9.2	relative measurement procedure
☒	ANSI C63.10	6.9.3	power bandwidth (99%) measurement procedure

4.6 Fundamental emission output power**VERDICT: PASS****4.6.1 Limit**

Standard		FCC Part 15 Subpart C Paragraph 15.247 (b)(3)
☒	GTX <6dBi	Pout≤30dBm
☐	GTX >6dBi	
☐	Non-Fix point-point	Pout≤30-(GTX -6)
☐	Fix point-point	Pout≤30-[(GTX-6)]/3
☐	Point-to-multipoint	Pout≤30-(GTX-6)
☐	Overlap Beams	Pout≤30-[(GTX-6)]/3
☐	Avgregate power transmitted simultaneously on all beams	Pout≤30-[(GTX-6)]/3
☐	single directional beam	Pout≤30-[(GTX-6)]/3+8dB

Note 1 : GTX directional gain of transmitting antennas.

Note 2 : Pout is maximum conducted output power .

4.6.2 Test Setup

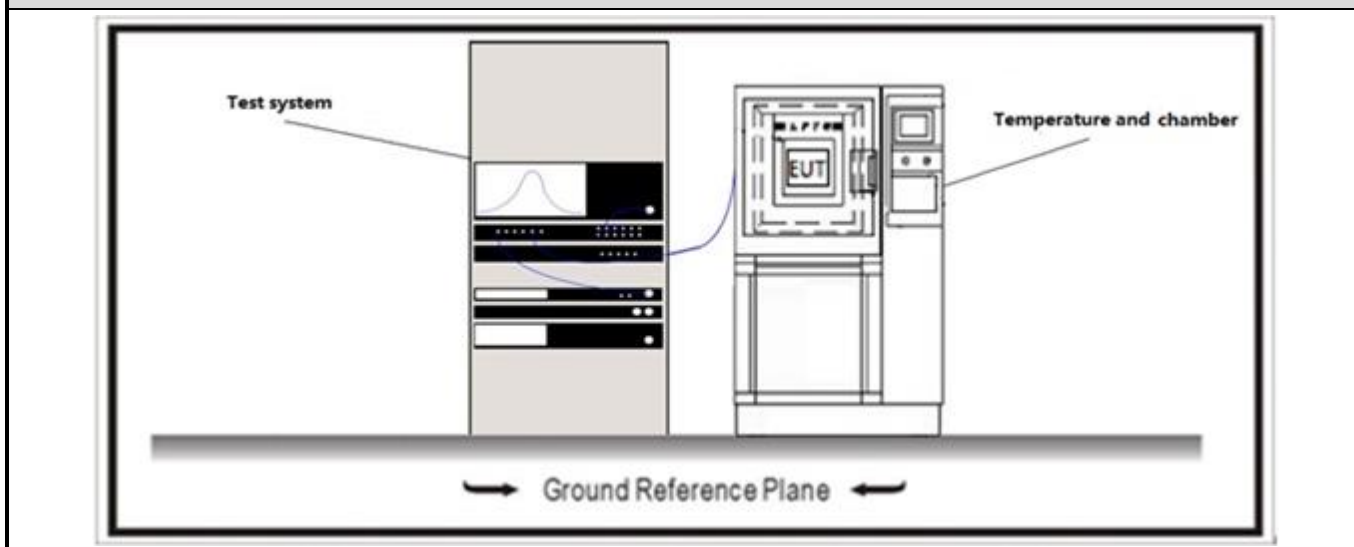
4.6.3 Test Procedure				
	References Rule		Chapter	Description
☒	ANSI C63.10		11.9	Fundamental emission output power
	☐	ANSI C63.10		Maximum peak conducted output power
	☐	☐	ANSI C63.10	11.9.1.1 RBW $\geq$ DTS bandwidth
		☐	ANSI C63.10	11.9.1.2 Integrated band power method
		☐	ANSI C63.10	11.9.1.3 PKPM1 Peak power meter method
	☒	ANSI C63.10		Maximum conducted (average) output power
	☐	☐	ANSI C63.10	11.9.2.2 Measurement using a spectrum analyzer (SA)
		☐	ANSI C63.10	11.9.2.2.2 Method AVGSA-1(Duty cycle $\geq$ 98%)
		☐	ANSI C63.10	11.9.2.2.3 Method AVGSA-1A(Duty cycle $\geq$ 98%)
		☐	ANSI C63.10	11.9.2.2.4 Method AVGSA-2(Duty cycle $\leq$ 98%)
		☐	ANSI C63.10	11.9.2.2.5 Method AVGSA-2A(Duty cycle $\leq$ 98%)
		☐	ANSI C63.10	11.9.2.2.4 Method AVGSA-3
		☐	ANSI C63.10	11.9.2.2.5 Method AVGSA-3A
		☒	ANSI C63.10	11.9.2.3 Measurement using a power meter (PM)
		☒	ANSI C63.10	11.9.2.3.1 Method AVGPM
		☐	ANSI C63.10	11.9.2.3.2 Method AVGPM-G

Directional Gain Calculations for In-Band test method

	References Rule		Chapter	Description
☐	KDB 662911		F2)a)	Basic methodology
	☐	KDB 662911	F2)a) (i)	transmit signals are correlated
	☐	KDB 662911	F2)a) (ii)	transmit signals are uncorrelated
☐	KDB 662911		F2)b)	Sectorized antenna systems.
☐	KDB 662911		F2)c)	Cross-polarized antennas
	☐	ANSI C63.10	F2)c) (i)	Cross-polarized antennas
	☐	ANSI C63.10	F2)c) (ii)	Multiple antennas
☐	KDB 662911		F2)e)	Spatial stream
	☐	KDB 662911	F2)e) (i)	Antennas have the same gain
	☐	KDB 662911	F2)e) (ii)	Antenna have the different gain with one spatial stream
	☐	KDB 662911	F2)e) (iii)	Antenna have the different gain with more than one spatial stream
☒	KDB 662911		F2)f)	Cyclic Delay Diversity (CDD)
	☒	KDB 662911	F2)f) (i)	Antennas have the same gain
	☐	KDB 662911	F2)f) (ii)	Antenna have the different gain with one spatial stream
	☐	KDB 662911	F2)f) (iii)	Antenna have the different gain with more than one spatial stream

4.7 Power Density**VERDICT: PASS****4.7.1 Limit:****Standard**

FCC Part 15 Subpart C Paragraph 15.247 (e)

Power Spectral Density $\leq 8\text{dBm}/3\text{kHz}$ **4.7.2 Test Setup****4.7.3 Test Procedure**

	References Rule		Chapter	Description
☒	ANSI C63.10		11.10	Maximum power spectral density level in the fundamental emission
	☒	ANSI C63.10	11.10.2	Method PKPSD (peak PSD)
	☐	ANSI C63.10	11.10.3	Method AVGPSD-1(Duty cycle $\geq 98\%$)
	☐	ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle $\geq 98\%$)
	☐	ANSI C63.10	11.10.5	Method AVGPSD-2(Duty cycle $< 98\%$)
	☐	ANSI C63.10	11.10.6	Method AVGPSD-2A(Duty cycle $< 98\%$)
	☐	ANSI C63.10	11.10.7	Method AVGPSD-3
	☐	ANSI C63.10	11.10.8	Method AVGPSD-3A

Directional Gain Calculations for In-Band test method				
	References Rule		Chapter	Description
☐	KDB 662911		F2)a)	Basic methodology
	☐	KDB 662911	F2)a) (i)	transmit signals are correlated
	☐	KDB 662911	F2)a) (ii)	transmit signals are uncorrelated
☐	KDB 662911		F2)b)	Sectorized antenna systems.
☐	KDB 662911		F2)c)	Cross-polarized antennas
	☐	ANSI C63.10	F2)c) (i)	Cross-polarized antennas
	☐	ANSI C63.10	F2)c) (ii)	Multiple antennas
☐	KDB 662911		F2)e)	Spatial stream
	☐	KDB 662911	F2)e) (i)	Antennas have the same gain
	☐	KDB 662911	F2)e) (ii)	Antenna have the different gain with one spatial stream
	☐	KDB 662911	F2)e) (iii)	Antenna have the different gain with more than one spatial stream
☒	KDB 662911		F2)f)	Cyclic Delay Diversity (CDD)
	☒	KDB 662911	F2)f) (i)	Antennas have the same gain
	☐	KDB 662911	F2)f) (ii)	Antenna have the different gain with one spatial stream
	☐	KDB 662911	F2)f) (iii)	Antenna have the different gain with more than one spatial stream

4.8 AC Power Line Conducted Emission

VERDICT: N/A

4.8.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.207	
Frequency range [MHz]	Limit: QP [dB(μV) ¹⁾]	Limit: AV [dB(μV) ¹⁾]
0,15 - 0,50	66 - 56 ²⁾	56 - 46 ²⁾
0,50 - 5,0	56	46
5,0 - 30	60	50

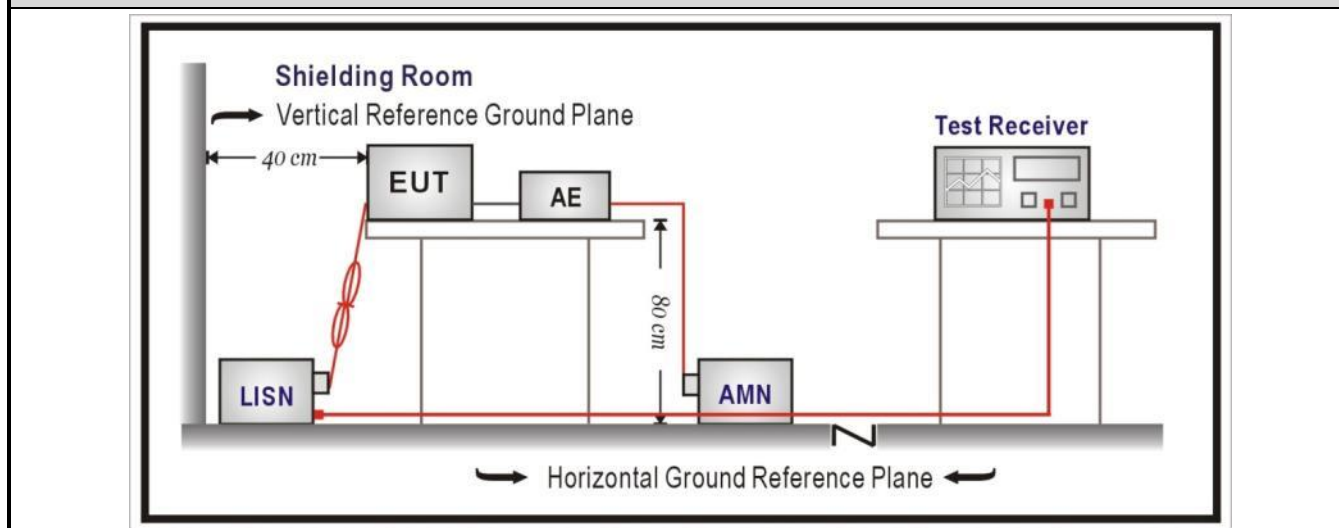
¹⁾ At the transition frequency, the lower limit applies.

²⁾ The limit decreases linearly with the logarithm of the frequency.

NOTE 1: The exclusion band for transmitters shall be considered for transmitters operating at frequencies below 30 MHz.

NOTE 2: Where the AC output port is directly connected (or via a circuit breaker) to the AC power input port of the EUT the AC power output port need not to be tested.

4.8.2 Test Setup



4.8.3 Test Procedure

	References Rule	Chapter	Item
☐	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices

4.9 Antenna Requirement	VERDICT: PASS
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4.9.1 Limit:	
Standard	FCC Part 15 Subpart C Paragraph 15.203
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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	

4.9.2 Antenna Connector Construction:	
☐	The use of a permanently attached antenna
☐	The antenna use of a unique coupling to the intentional radiator
☒	The use of a nonstandard antenna jack or electrical connector
Please refer to the attached document "Internal Photograph" to show the antenna connector.	

5 TEST SETUP PHOTO AND EUT PHOTO

Remark: The test setup photo and EUT Photo please see appendix.

6 TEST RESULT

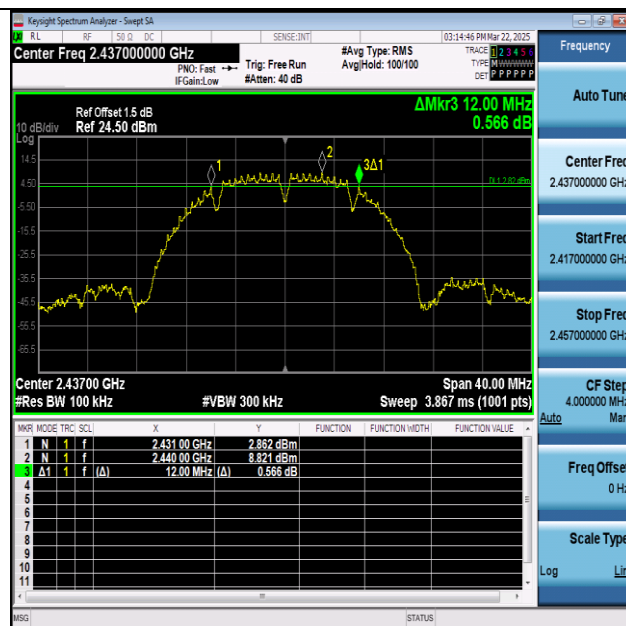
Appendix A: DTS Bandwidth

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.120	2406.960	2417.080	0.5	PASS
11B	Ant1	2437	12.000	2431.000	2443.000	0.5	PASS
11B	Ant1	2462	10.160	2456.920	2467.080	0.5	PASS
11G	Ant1	2412	16.280	2403.840	2420.120	0.5	PASS
11G	Ant1	2437	16.320	2428.840	2445.160	0.5	PASS
11G	Ant1	2462	16.320	2453.840	2470.160	0.5	PASS
11N20SISO	Ant1	2412	17.280	2403.480	2420.760	0.5	PASS
11N20SISO	Ant1	2437	17.600	2428.200	2445.800	0.5	PASS
11N20SISO	Ant1	2462	17.600	2453.200	2470.800	0.5	PASS
11N40SISO	Ant1	2422	31.200	2405.760	2436.960	0.5	PASS
11N40SISO	Ant1	2437	35.920	2419.240	2455.160	0.5	PASS
11N40SISO	Ant1	2452	36.320	2433.840	2470.160	0.5	PASS
11AX20SISO	Ant1	2412	13.800	2404.520	2418.320	0.5	PASS
11AX20SISO	Ant1	2437	18.200	2427.840	2446.040	0.5	PASS
11AX20SISO	Ant1	2462	18.480	2452.760	2471.240	0.5	PASS
11AX40SISO	Ant1	2422	29.920	2407.040	2436.960	0.5	PASS
11AX40SISO	Ant1	2437	37.840	2418.120	2455.960	0.5	PASS
11AX40SISO	Ant1	2452	37.840	2433.120	2470.960	0.5	PASS

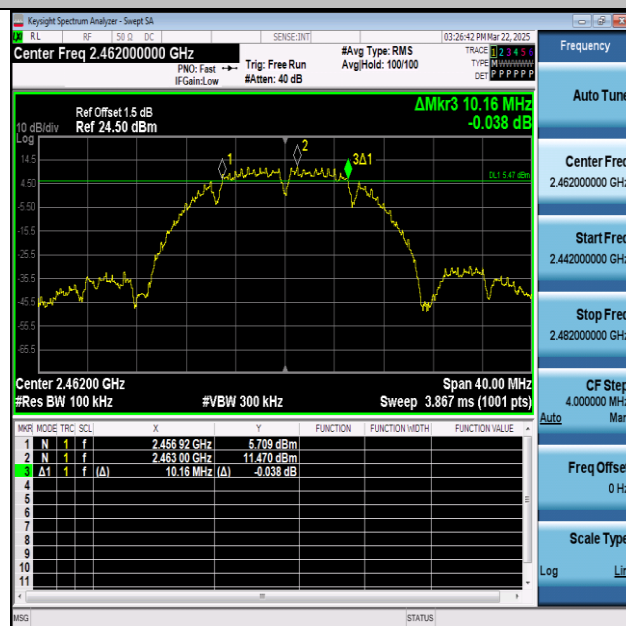
Note: We have evaluated SISO, MIMO mode, shown in the report is the worst data.



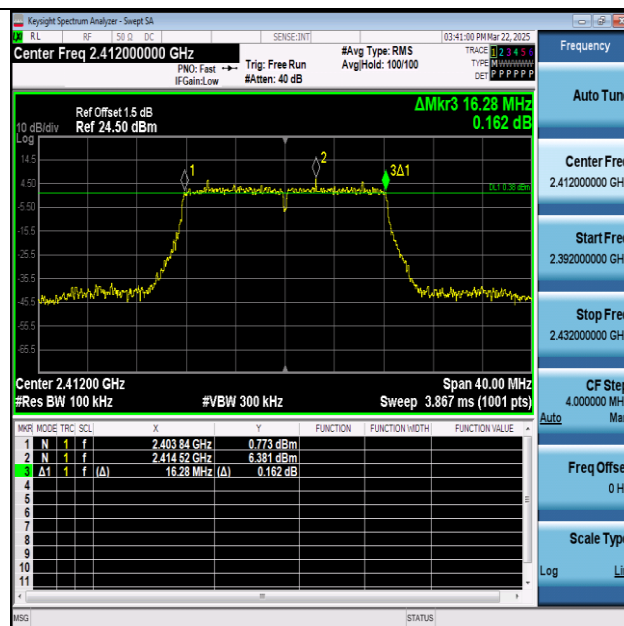
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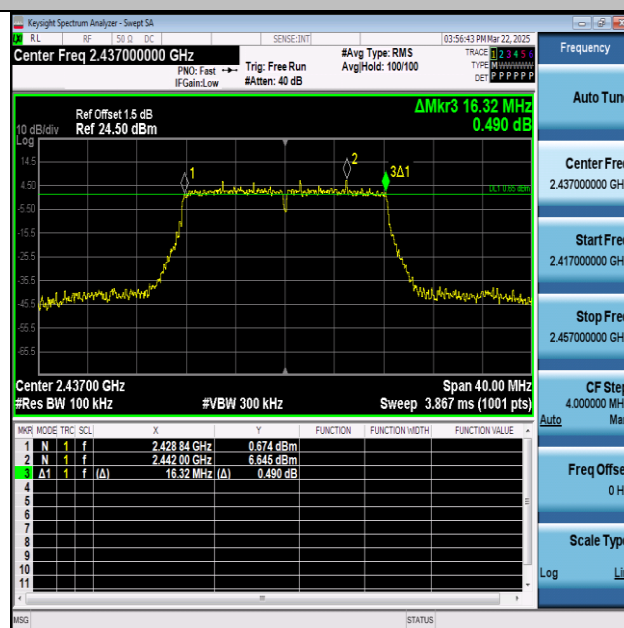
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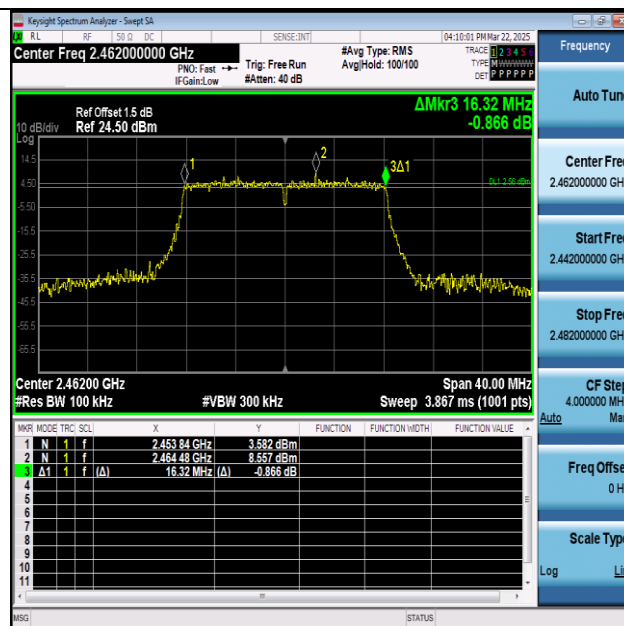
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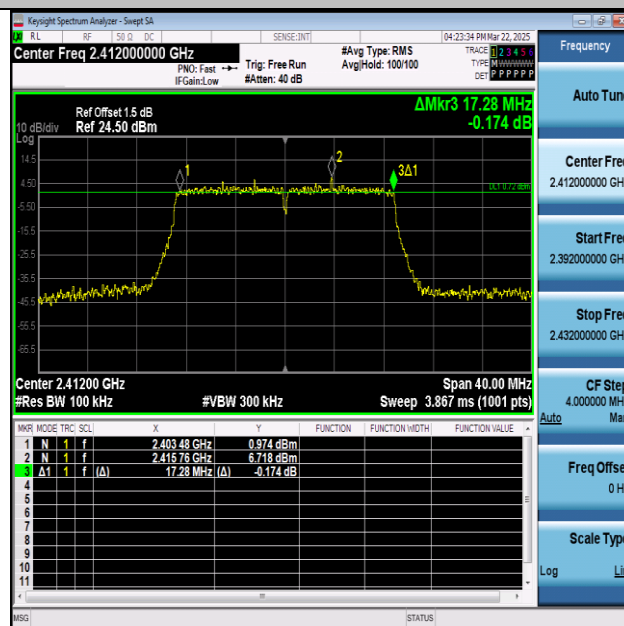
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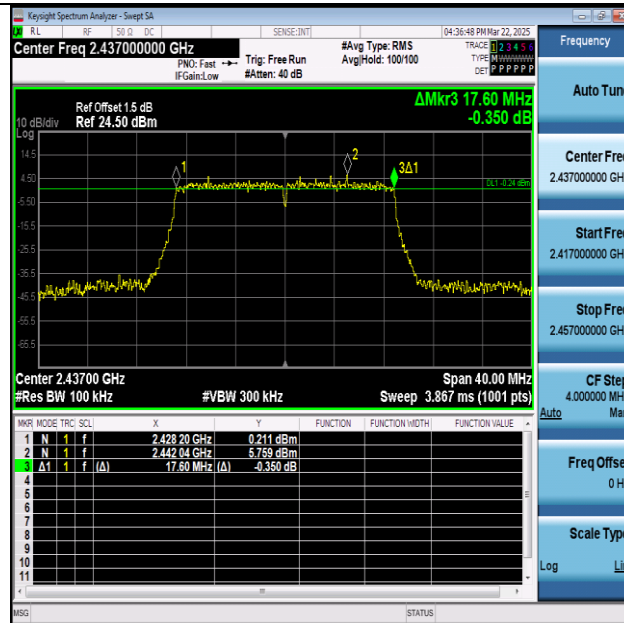
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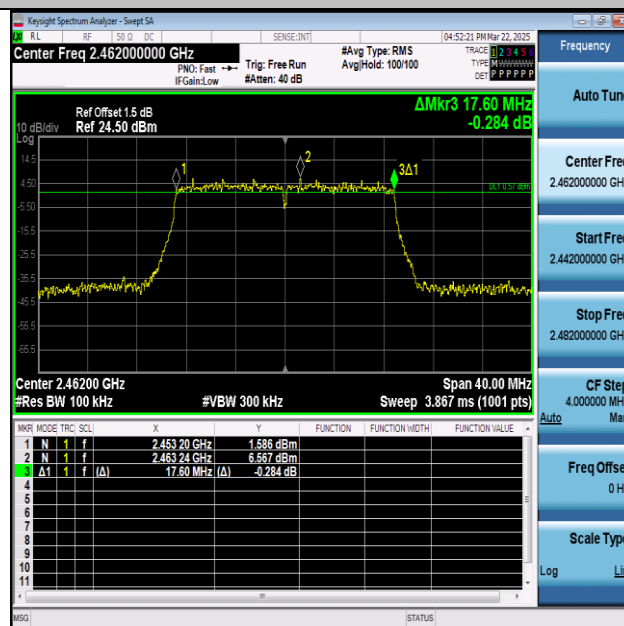
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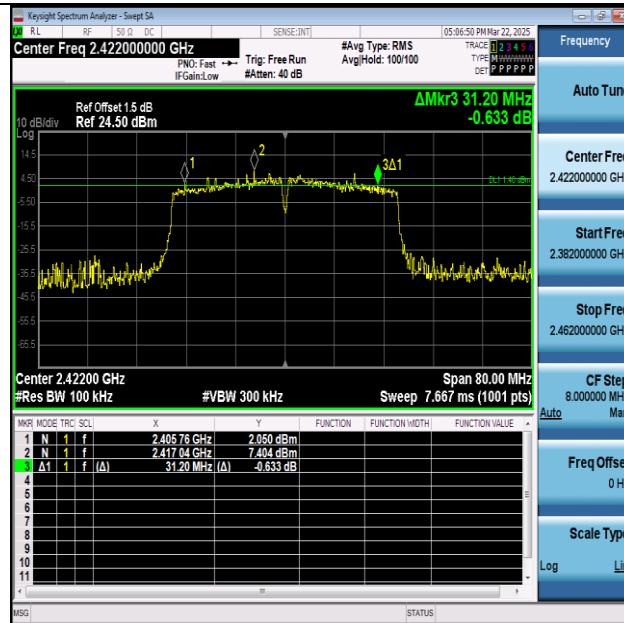
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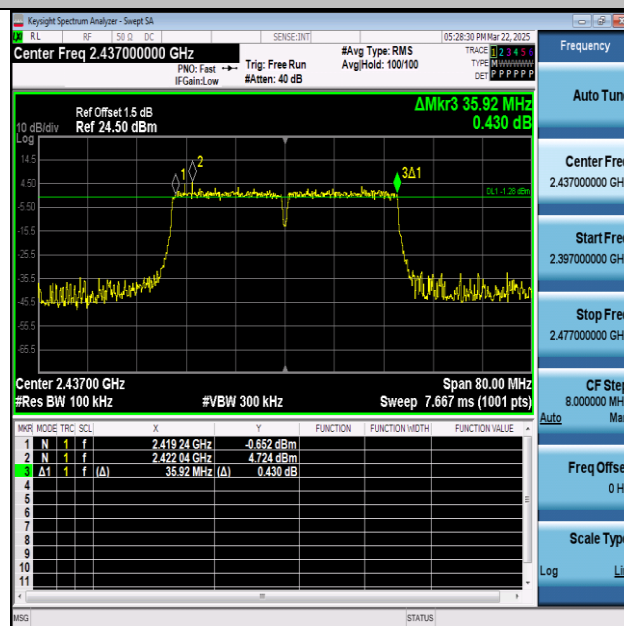
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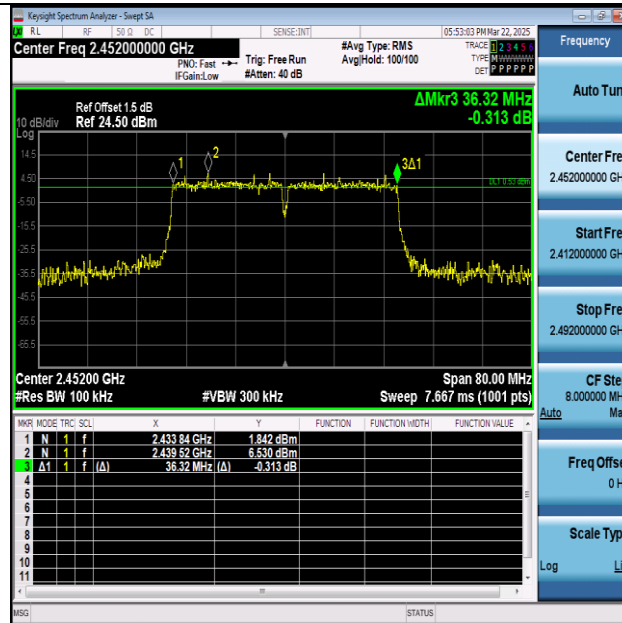
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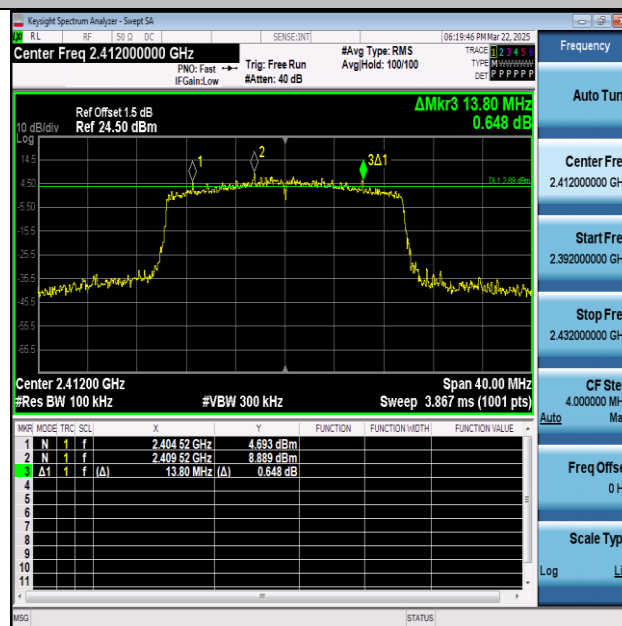
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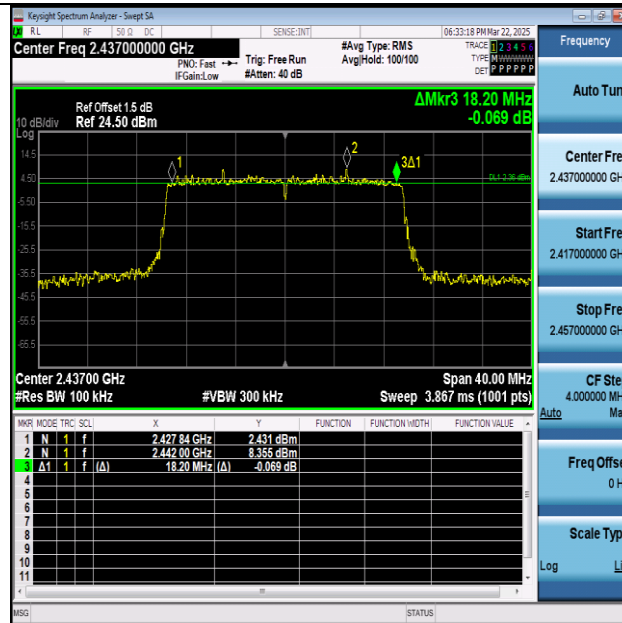
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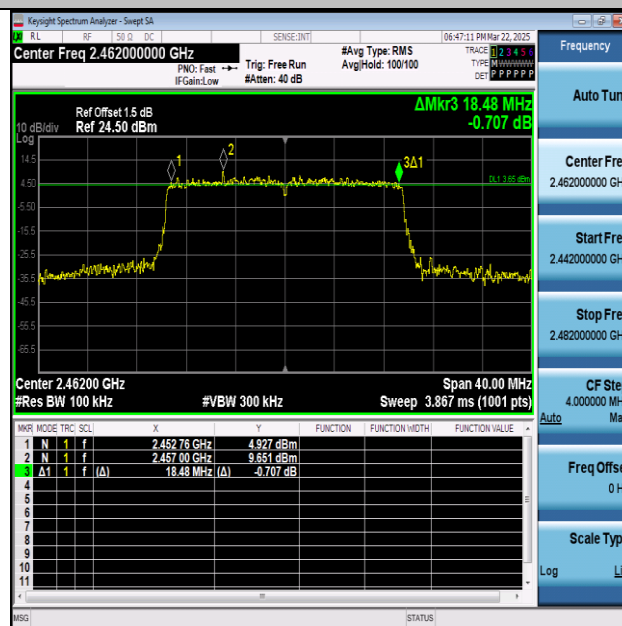
11N40SISO-Ant1-2452-PASS



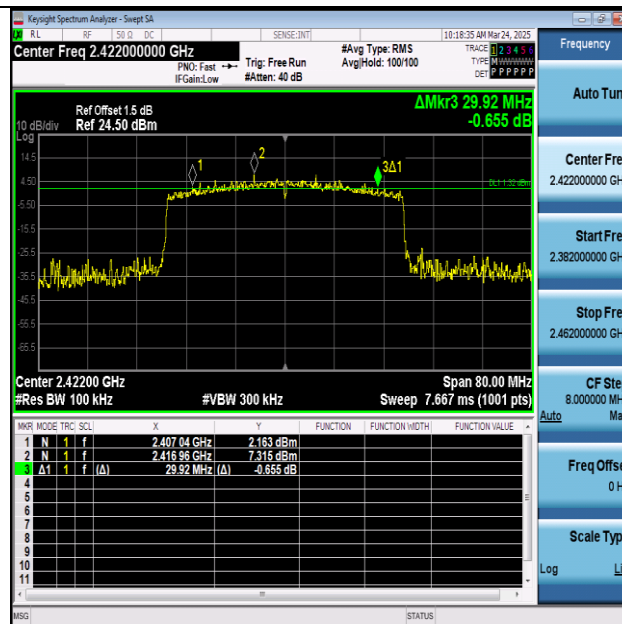
11AX20SISO-Ant1-2412-PASS



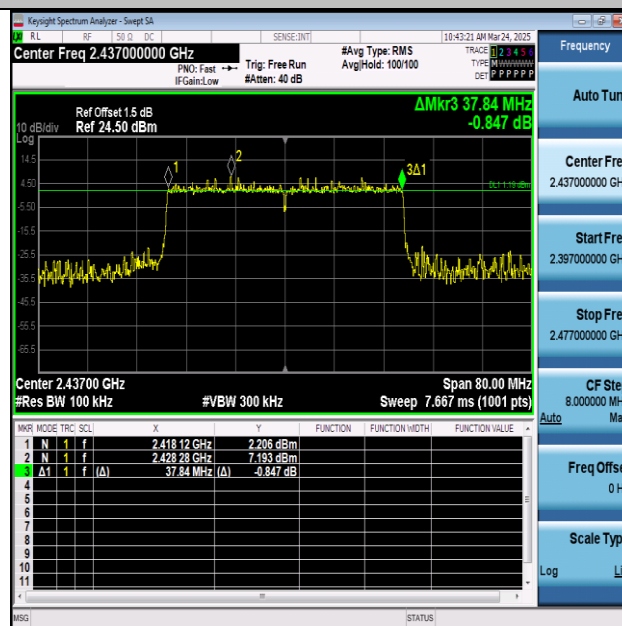
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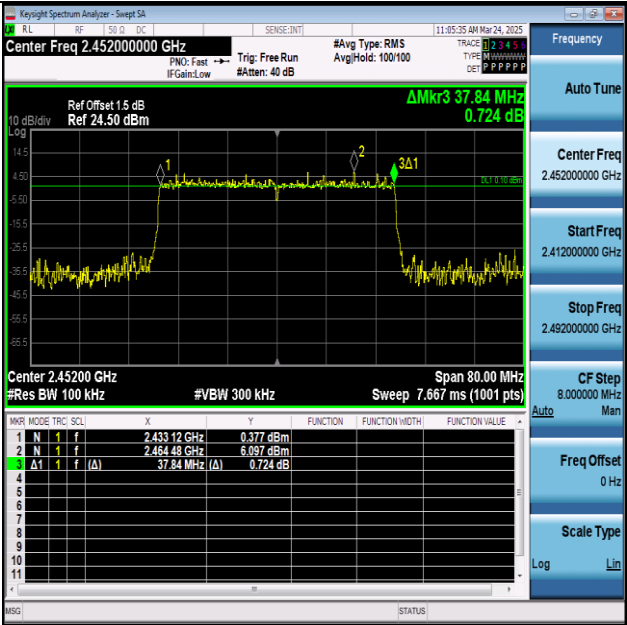
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11AX40SISO-Ant1-2422-PASS



11AX40SISO-Ant1-2437-PASS

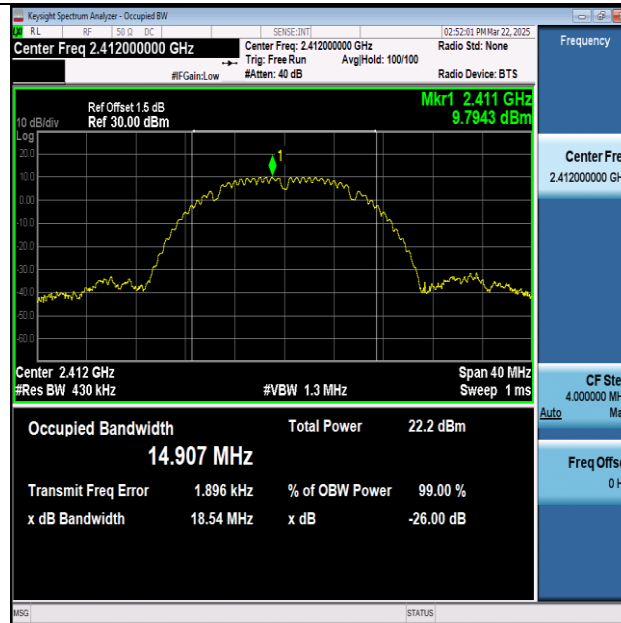


11AX40SISO-Ant1-2452-PASS

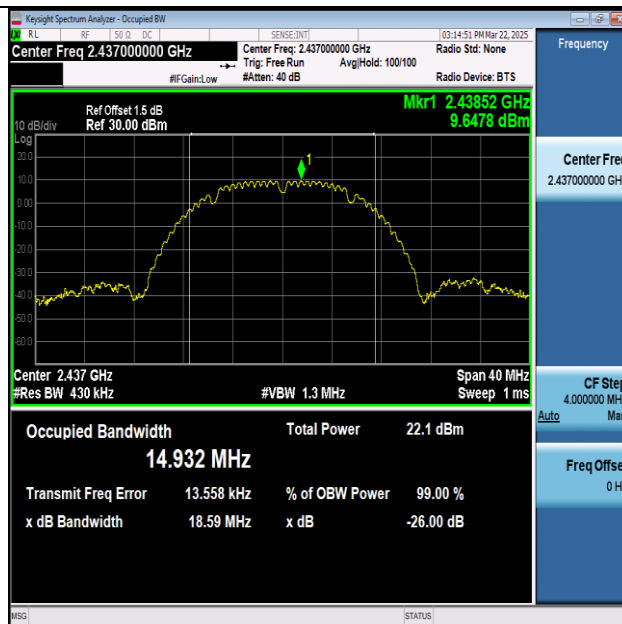
Appendix B: Occupied Channel Bandwidth

TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	14.907	2404.5484	2419.4554	---	---
11B	Ant1	2437	14.932	2429.5476	2444.4796	---	---
11B	Ant1	2462	14.945	2454.5256	2469.4706	---	---
11G	Ant1	2412	16.487	2403.7928	2420.2798	---	---
11G	Ant1	2437	16.537	2428.7375	2445.2745	---	---
11G	Ant1	2462	16.468	2453.7832	2470.2512	---	---
11N20SISO	Ant1	2412	17.674	2403.1682	2420.8422	---	---
11N20SISO	Ant1	2437	17.630	2428.1664	2445.7964	---	---
11N20SISO	Ant1	2462	17.663	2453.1534	2470.8164	---	---
11N40SISO	Ant1	2422	35.744	2404.1607	2439.9047	---	---
11N40SISO	Ant1	2437	36.225	2418.8925	2455.1175	---	---
11N40SISO	Ant1	2452	36.302	2433.8483	2470.1503	---	---
11AX20SISO	Ant1	2412	18.676	2402.6670	2421.3430	---	---
11AX20SISO	Ant1	2437	18.954	2427.5271	2446.4811	---	---
11AX20SISO	Ant1	2462	18.949	2452.5077	2471.4567	---	---
11AX40SISO	Ant1	2422	37.314	2403.3649	2440.6789	---	---
11AX40SISO	Ant1	2437	37.895	2418.0910	2455.9860	---	---
11AX40SISO	Ant1	2452	37.974	2432.9944	2470.9684	---	---

Note: We have evaluated SISO, MIMO mode, shown in the report is the worst data.



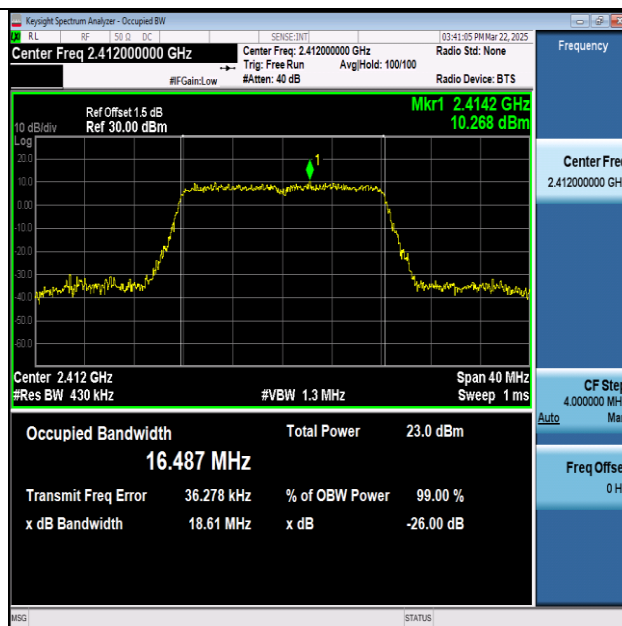
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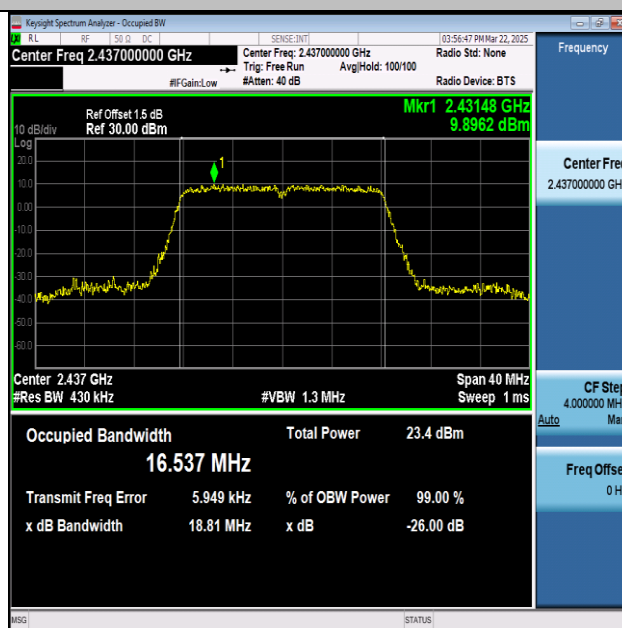
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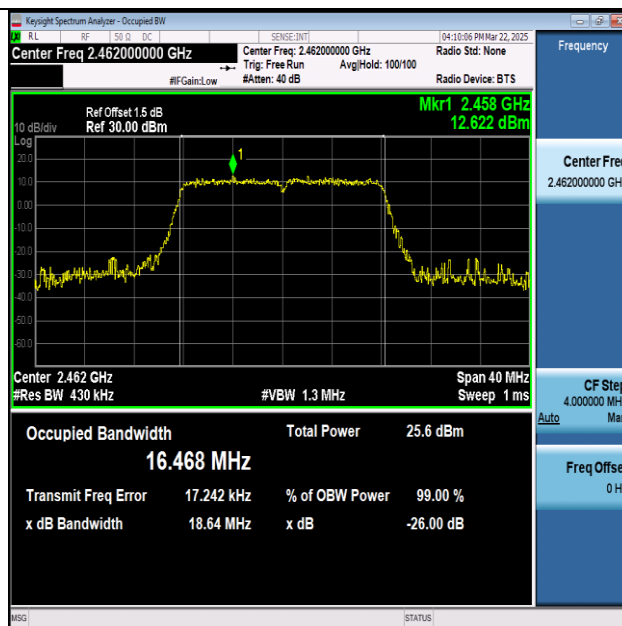
11B-Ant1-2462



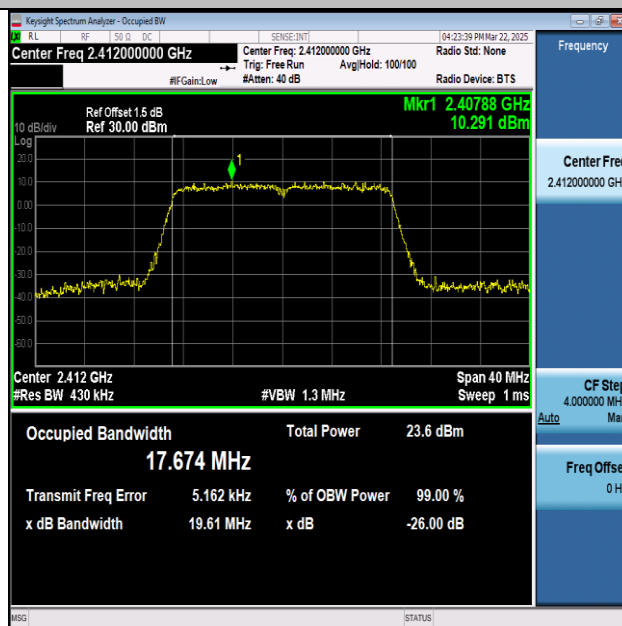
11G-Ant1-2412



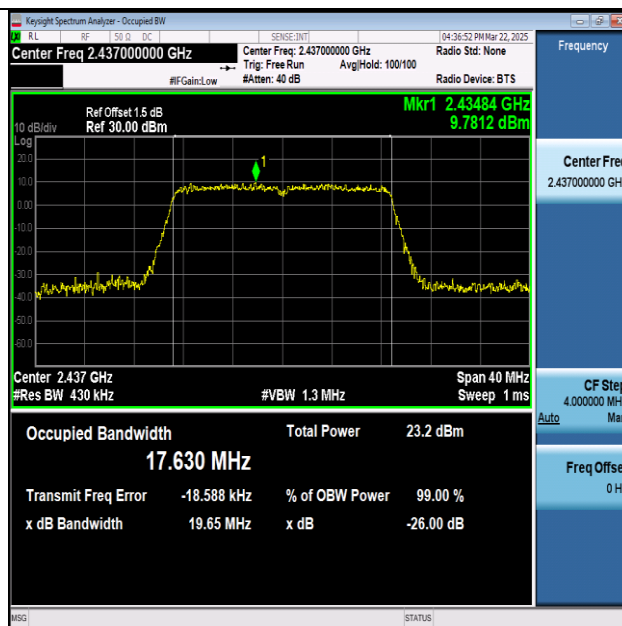
11G-Ant1-2437



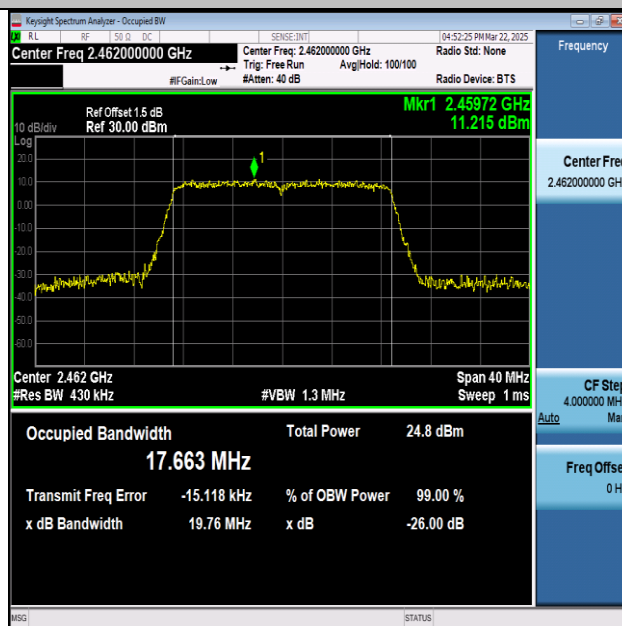
11G-Ant1-2462



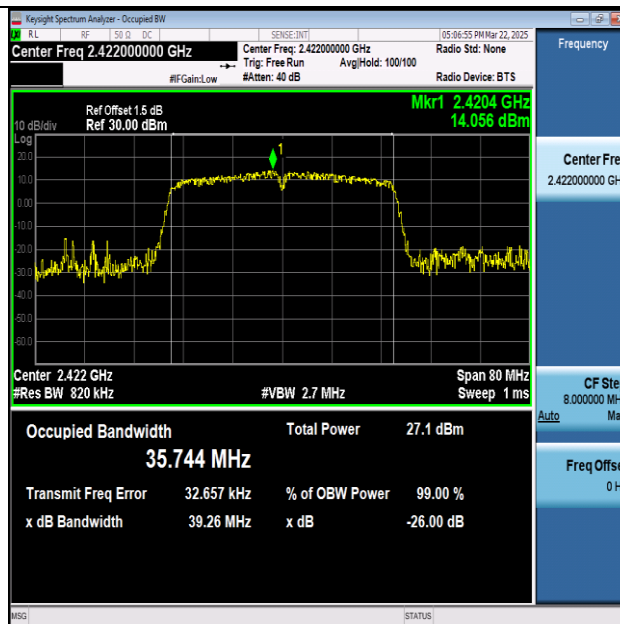
11N20SISO-Ant1-2412



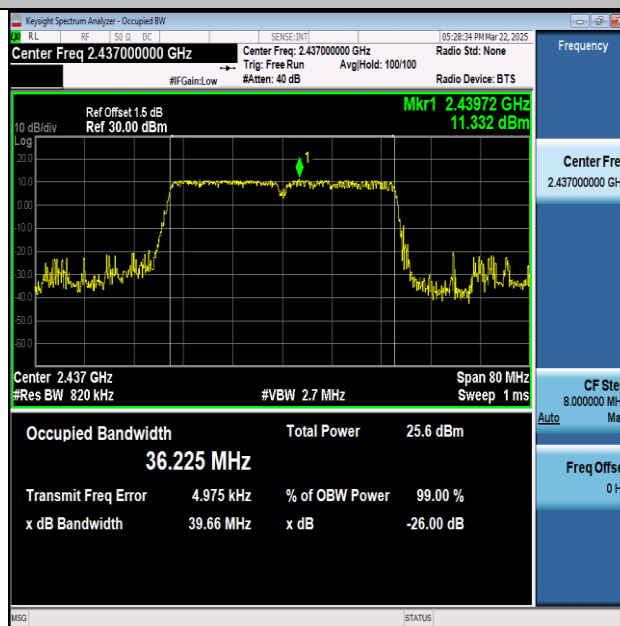
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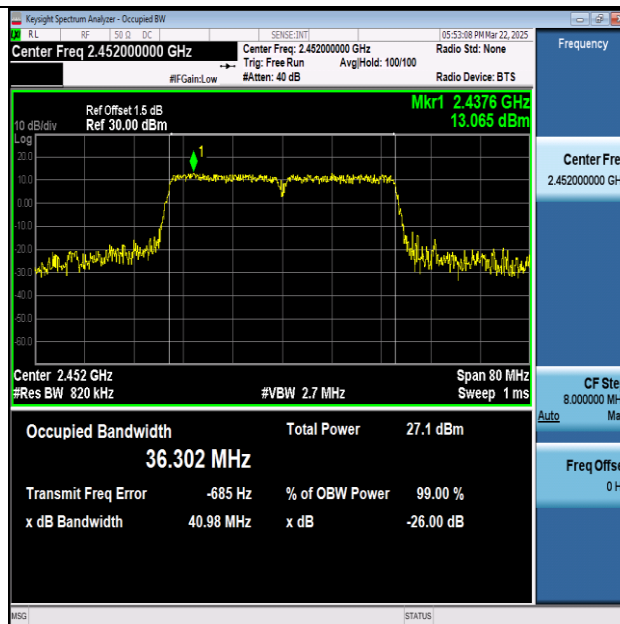
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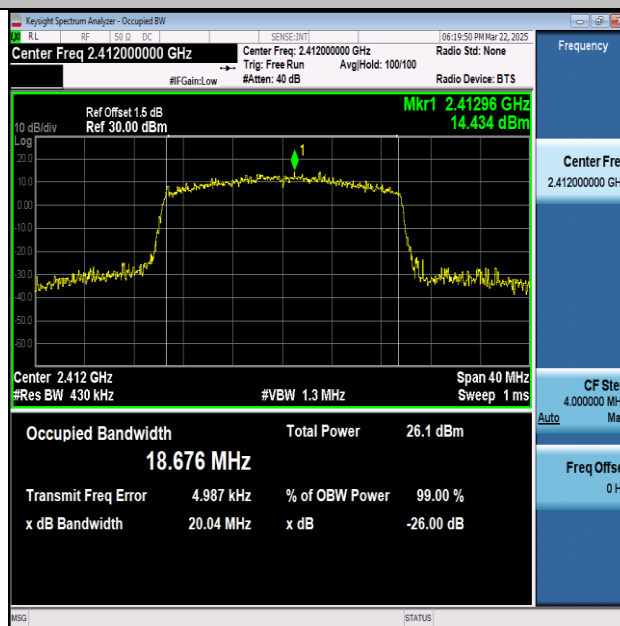
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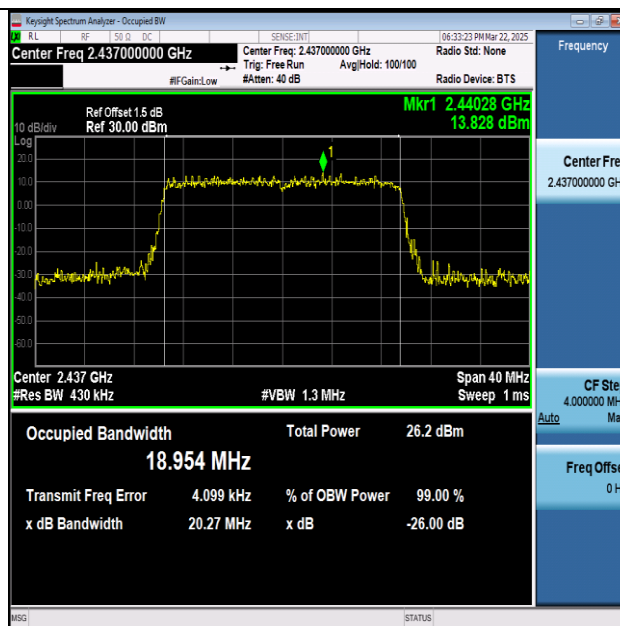
11N40SISO-Ant1-2437



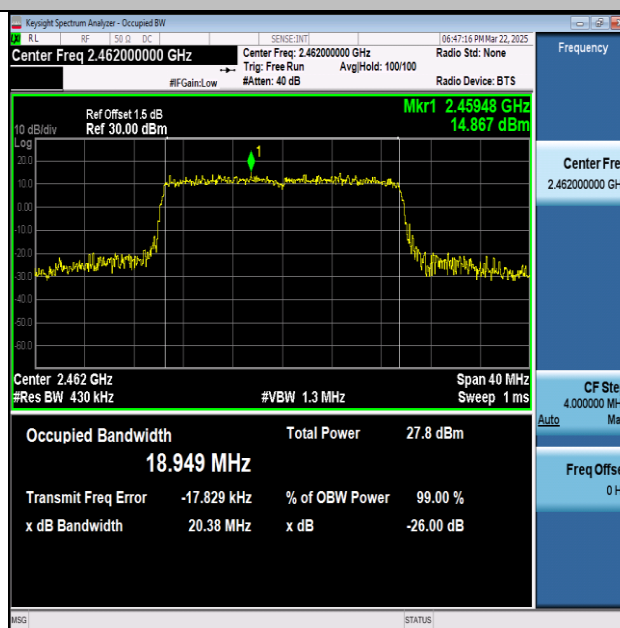
11N40SISO-Ant1-2452



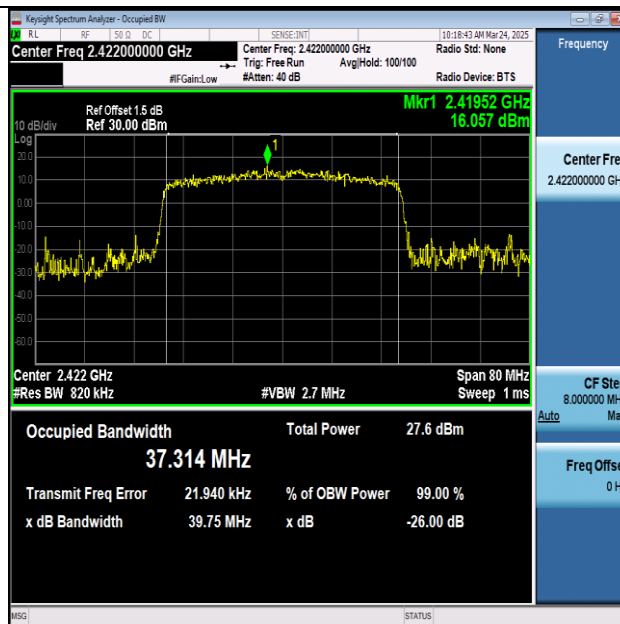
11AX20SISO-Ant1-2412



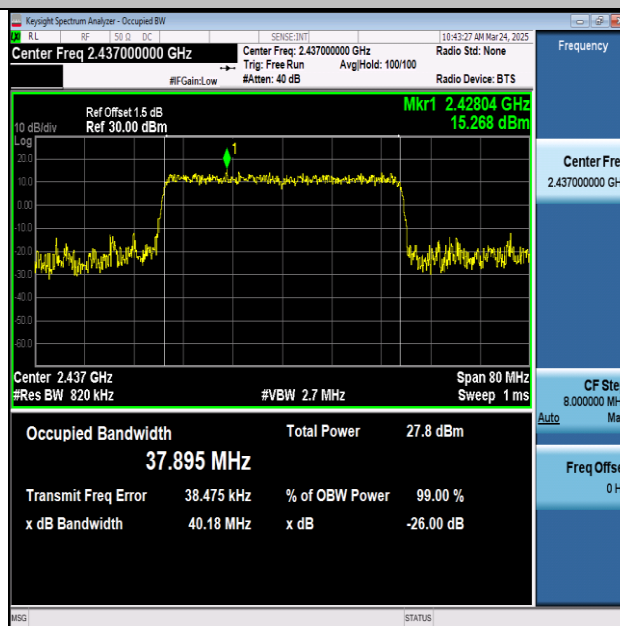
11AX20SISO-Ant1-2437



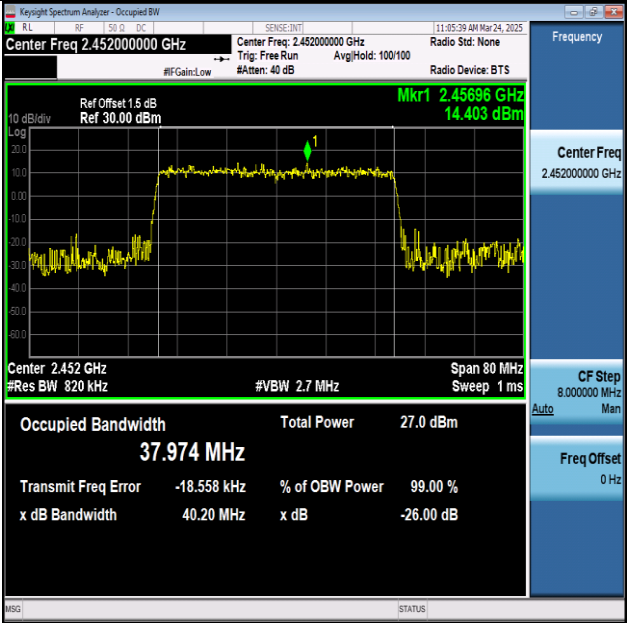
11AX20SISO-Ant1-2462



11AX40SISO-Ant1-2422



11AX40SISO-Ant1-2437



11AX40SISO-Ant1-2452

Appendix C: Maximum conducted output power

SISO:						
Mode	Channel	Frequency (MHz)	Conducted Power(dBm)		Limit(dBm)	Verdict
			Ant 1	Ant 2		
802.11b	1	2412	19.30	19.21	30	PASS
	6	2437	19.87	19.78	30	PASS
	11	2462	21.61	21.50	30	PASS
802.11g	1	2412	19.10	19.02	30	PASS
	6	2437	19.41	19.36	30	PASS
	11	2462	19.71	19.58	30	PASS
802.11n(20MHz)	1	2412	19.90	19.78	30	PASS
	6	2437	20.04	19.88	30	PASS
	11	2462	19.15	19.01	30	PASS
802.11n(40MHz)	3	2422	20.28	20.28	30	PASS
	6	2437	20.04	19.94	30	PASS
	9	2452	17.73	17.68	30	PASS
802.11ax(20MHz)	1	2412	19.76	19.58	30	PASS
	6	2437	19.76	19.58	30	PASS
	11	2462	19.88	19.74	30	PASS
802.11ax(40MHz)	3	2422	19.95	19.77	30	PASS
	6	2437	20.03	19.83	30	PASS
	9	2452	17.65	17.50	30	PASS

MIMO:							
Mode	Channel	Frequency (MHz)	Conducted Power(dBm)			Limit(dBm)	Verdict
			Ant 1	Ant 2	Ant 1+2		
802.11n(20MHz)	1	2412	16.55	16.47	19.52	30.00	PASS
	6	2437	16.65	16.76	19.72	30.00	PASS
	11	2462	15.98	15.62	18.81	30.00	PASS
802.11n(40MHz)	3	2422	17.08	17.14	20.12	30.00	PASS
	6	2437	16.86	16.66	19.77	30.00	PASS
	9	2452	14.44	14.27	17.37	30.00	PASS
802.11ax(20MHz)	1	2412	16.44	16.33	19.40	30.00	PASS
	6	2437	16.37	16.34	19.37	30.00	PASS
	11	2462	16.62	16.48	19.56	30.00	PASS
802.11ax(40MHz)	3	2422	16.73	16.53	19.64	30.00	PASS
	6	2437	16.65	16.58	19.63	30.00	PASS
	9	2452	14.34	14.29	17.33	30.00	PASS

Appendix D: Maximum power spectral density

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-12.67	≤8.00	PASS
11B	Ant1	2437	-13.42	≤8.00	PASS
11B	Ant1	2462	-11.84	≤8.00	PASS
11G	Ant1	2412	-11.45	≤8.00	PASS
11G	Ant1	2437	-12.03	≤8.00	PASS
11G	Ant1	2462	-14.35	≤8.00	PASS
11N20MIMO	Ant1+2	2412	-11.45	≤6.69	PASS
11N20MIMO	Ant1+2	2437	-13.43	≤6.69	PASS
11N20 MIMO	Ant1+2	2462	-13.20	≤6.69	PASS
11N40 MIMO	Ant1+2	2422	-12.44	≤6.69	PASS
11N40 MIMO	Ant1+2	2437	-13.11	≤6.69	PASS
11N40 MIMO	Ant1+2	2452	-16.34	≤6.69	PASS
11AX20 MIMO	Ant1+2	2412	-10.33	≤6.69	PASS
11AX20 MIMO	Ant1+2	2437	-11.83	≤6.69	PASS
11AX20 MIMO	Ant1+2	2462	-12.29	≤6.69	PASS
11AX40 MIMO	Ant1+2	2422	-12.16	≤6.69	PASS
11AX40 MIMO	Ant1+2	2437	-11.94	≤6.69	PASS
11AX40 MIMO	Ant1+2	2452	-14.04	≤6.69	PASS

Note1. We have evaluated SISO, MIMO mode, shown in the report is the worst data.

Note2. MIMO PSD Limit = 8 dBm/3kHz + 6dBi - (4.3 -10*Log(N))dBi, N = Number of antennas.



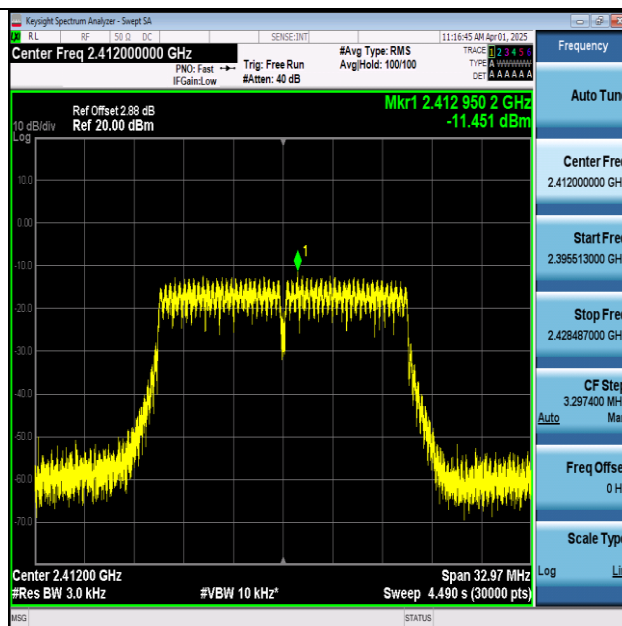
11B-Ant1-2412-PASS



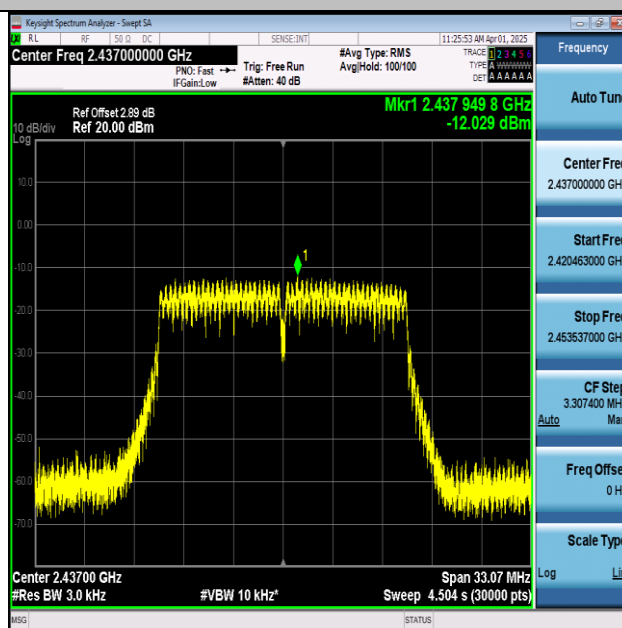
11B-Ant1-2437-PASS



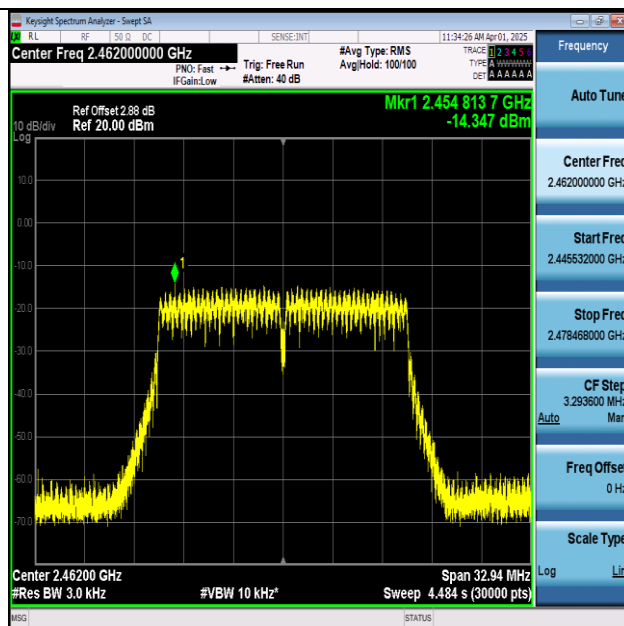
11B-Ant1-2462-PASS



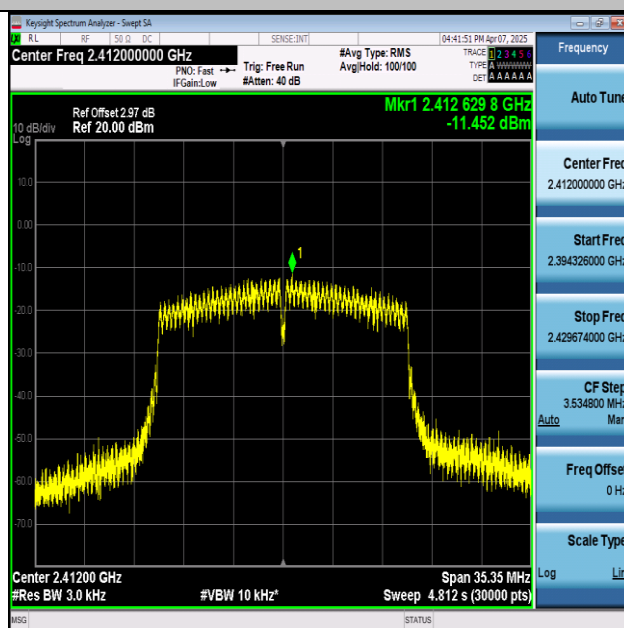
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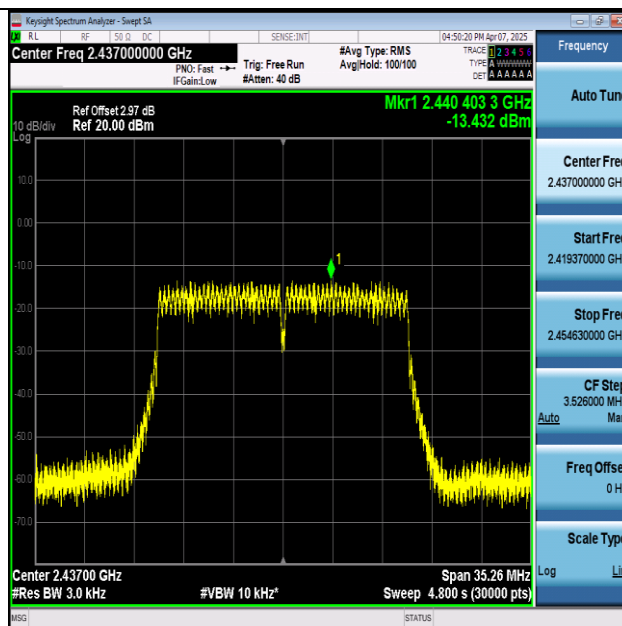
11G-Ant1-2437-PASS



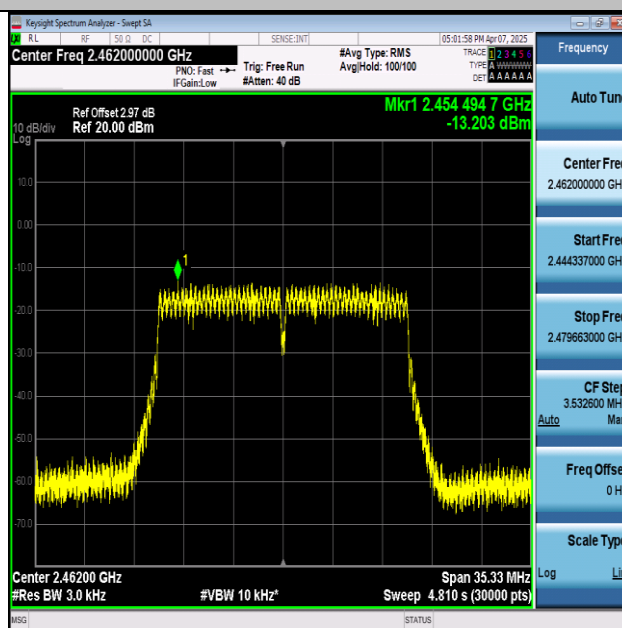
11G-Ant1-2462-PASS



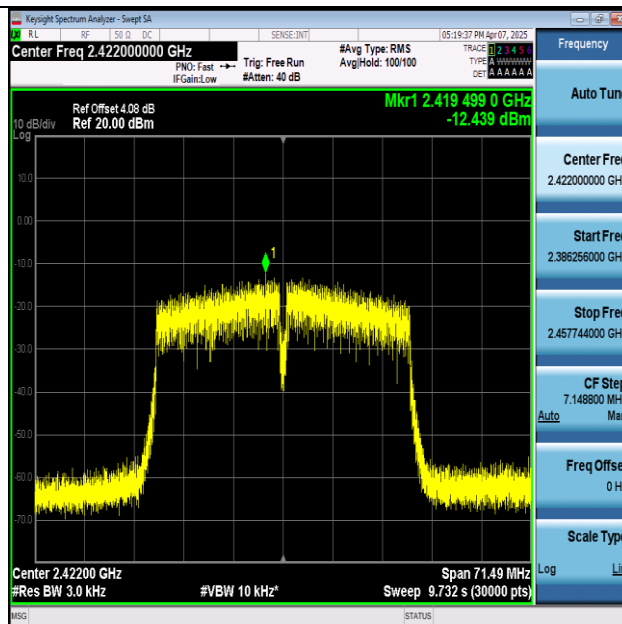
11N20MIMO-Ant1+2-2412-PASS



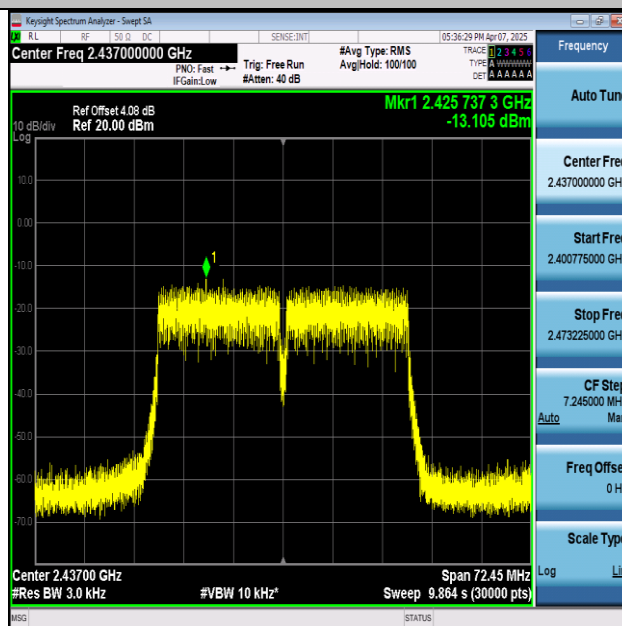
11N20MIMO-Ant1+2-2437-PASS



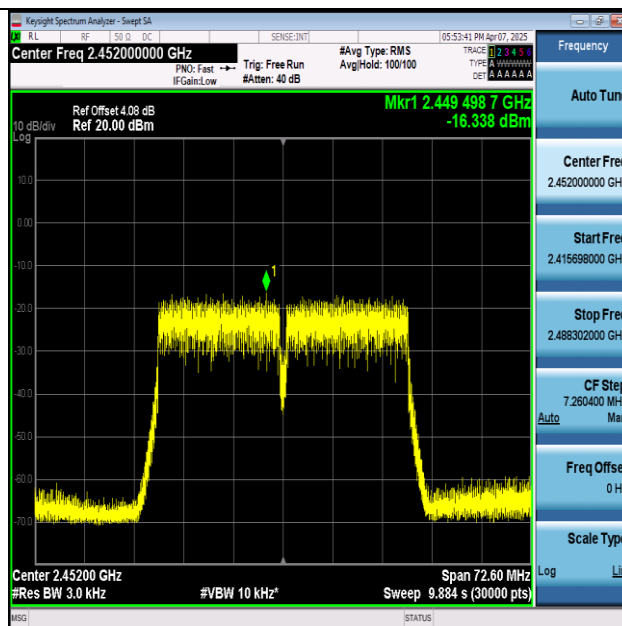
11N20MIMO-Ant1+2-2462-PASS



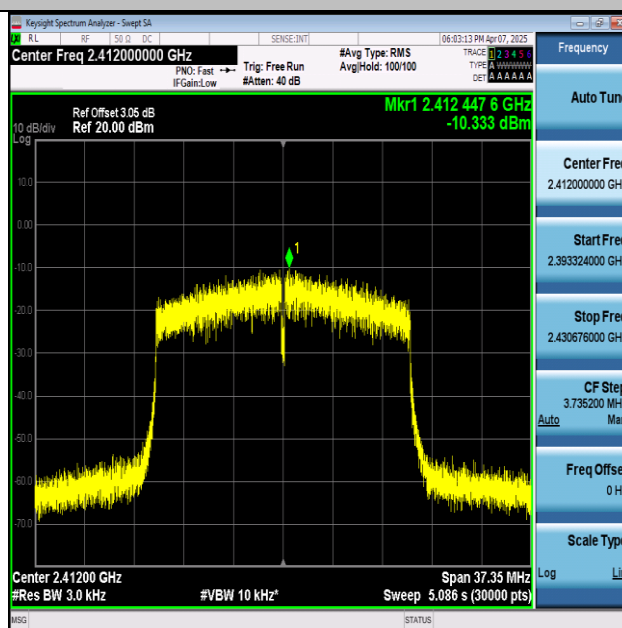
11N40MIMO-Ant1+2-2422-PASS



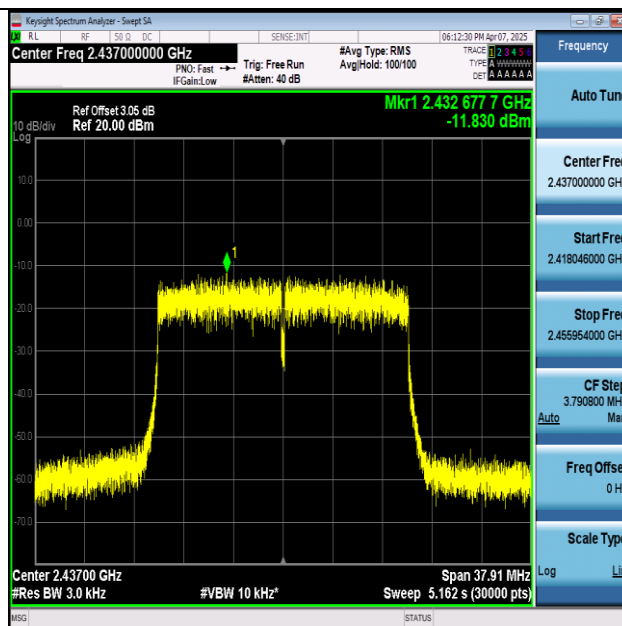
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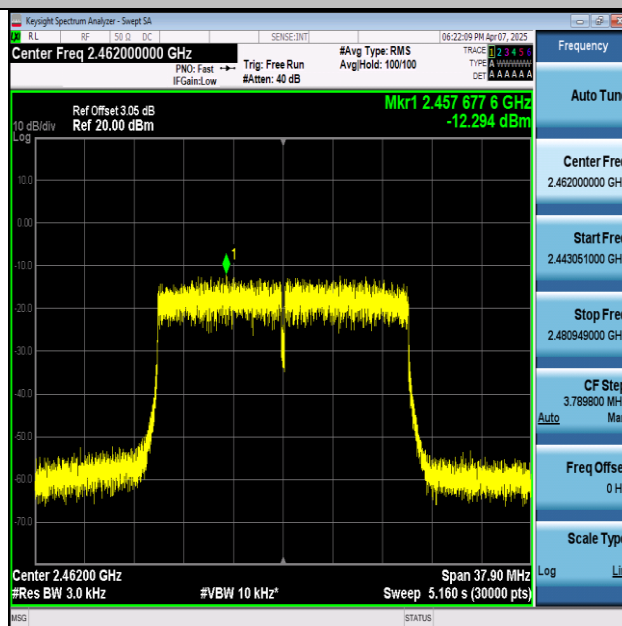
11N40MIMO-Ant1+2-2452-PASS



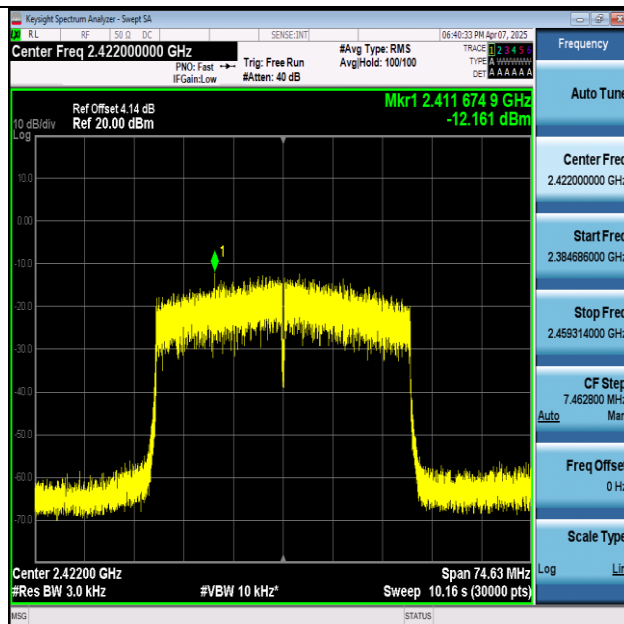
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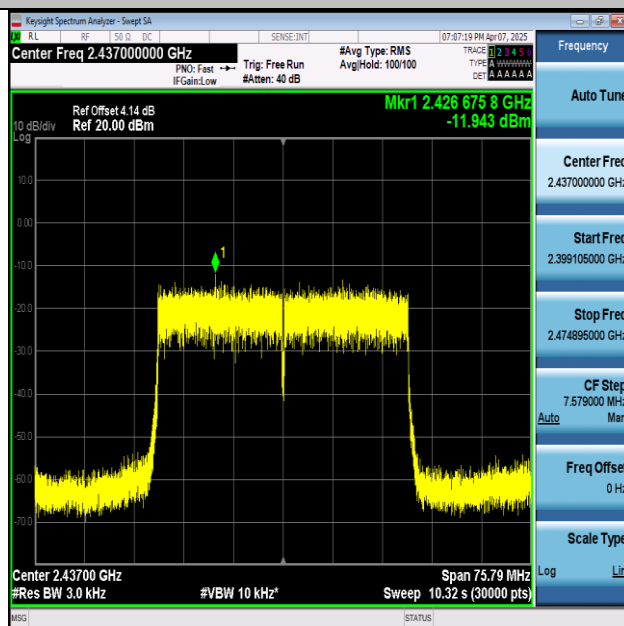
11AX20MIMO-Ant1+2-2437-PASS



11AX20MIMO-Ant1+2-2462-PASS



11AX40MIMO-Ant1+2-2422-PASS



11AX40MIMO-Ant1+2-2437-PASS