

TEST REPORT

Reference No..... : WTX25X10271254W001
FCC ID : 2BEAP-BF05
Applicant : Dongguan Lingdu Electronic Technology Co., Ltd.
Address : No.1, Longcheng Street, Qingxi Town, Dongguan City, Guangdong
Province, China
Manufacturer : The same as Applicant
Address : The same as Applicant
Product Name : Bird Feeder with Camera
Model No..... : BF05
Standards : FCC Part 15.407
Date of Receipt sample : 2025-10-16
Date of Test..... : 2025-10-17 to 2025-11-11
Date of Issue : 2025-11-12
Test Report Form No. : WTX_Part 15_407W
Test Result..... : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

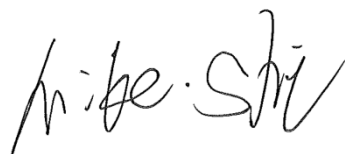
Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,
Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Email: sem@waltek.com.cn

Tested by:



Mike Shi/Project Engineer

Approved by:



Jason Su/Manager

TABLE OF CONTENTS

1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2 TEST STANDARDS.....	6
1.3 TEST METHODOLOGY	6
1.4 TABLE FOR PARAMETERS OF TEST SOFTWARE SETTING.....	6
1.5 EUT OPERATING DURING TEST.....	6
1.6 TEST FACILITY	7
1.7 EUT SETUP AND TEST MODE	8
1.8 MEASUREMENT UNCERTAINTY	9
1.9 TEST EQUIPMENT LIST AND DETAILS	10
2. SUMMARY OF TEST RESULTS.....	14
3. ANTENNA REQUIREMENT.....	15
3.1 STANDARD APPLICABLE	15
3.2 EVALUATION INFORMATION	15
4. AUTOMATICALLY DISCONTINUE TRANSMISSION	16
4.1 STANDARD APPLICABLE	16
4.2 SUMMARY OF TEST RESULTS.....	16
5. POWER SPECTRAL DENSITY	17
5.1 STANDARD APPLICABLE	17
5.2 TEST PROCEDURE	17
5.3 SUMMARY OF TEST RESULTS/PLOTS.....	18
6. EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH	19
6.1 STANDARD APPLICABLE	19
6.2 TEST PROCEDURE	19
6.3 SUMMARY OF TEST RESULTS/PLOTS.....	21
7. MAXIMUM CONDUCTED OUTPUT POWER	22
7.1 STANDARD APPLICABLE	22
7.2 TEST PROCEDURE	22
7.3 SUMMARY OF TEST RESULTS/PLOTS.....	23
8. RADIATED SPURIOUS EMISSIONS	24
8.1 STANDARD APPLICABLE	24
8.2 TEST PROCEDURE	24
8.3 TEST RECEIVER SETUP	26
8.4 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	26
8.5 SUMMARY OF TEST RESULTS/PLOTS.....	26
9. FREQUENCY STABILITY	46
9.1 STANDARD APPLICABLE	46
9.2 TEST PROCEDURE	46
9.3 SUMMARY OF TEST RESULTS/PLOTS.....	46
10. CONDUCTED EMISSIONS	47
10.1 TEST PROCEDURE.....	47
10.2 BASIC TEST SETUP BLOCK DIAGRAM	47
10.3 TEST RECEIVER SETUP	47
10.4 SUMMARY OF TEST RESULTS/PLOTS	47
APPENDIX SUMMARY	50
APPENDIX A1: EMISSION BANDWIDTH	51
APPENDIX A2: OCCUPIED CHANNEL BANDWIDTH	58
APPENDIX B: DUTY CYCLE.....	65
APPENDIX C: MAXIMUM CONDUCTED OUTPUT POWER	72
APPENDIX D: MAXIMUM POWER SPECTRAL DENSITY	79
APPENDIX E: FREQUENCY STABILITY	86

APPENDIX PHOTOGRAPHS.....95

Report version

Version No.	Date of issue	Description
Rev.00	2025-11-12	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	Bird Feeder with Camera
Trade Name:	/
Model No.:	BF05
Adding Model(s):	BF06, BF03, BF02, BF01, BF05S, BF06S, BF03S, BF02S, BF01S, BF05T, BF06T, BF03D, BF02D, BF01D, BF05 Pro, BF06 Pro, BF03 Pro, BF02 Pro, BF01 Pro, BF05 Max, BF06 Max, BF04, BF04L, BF04 Pro, BF04 Max
Rated Voltage:	Charging port:DC5V Battery:DC3.6V
Battery Capacity:	5200mAh
Power Adapter:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model BF05, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Support Standards:	802.11a, 802.11n(HT20), 802.11n-HT40, 802.11ac-VHT20/40, 802.11ax-HE20/40
Frequency Range:	5180-5240MHz
Max. RF Output Power:	15.77dBm (Conducted)
Type of Modulation:	QPSK, 16QAM, 64QAM,256QAM,1024QAM
Type of Antenna:	FPC Antenna
Antenna Gain:	1.96dBi
<i>Note The Antenna Gain is provided by the customer and can affect the validity of results.</i>	

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.407: General technical requirements.

ANSI C63.10-2020: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

KDB789033 D02 v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-Nii) Devices Part 15, Subparte.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020, KDB789033 D02 v02r01. The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Table for parameters of Test Software setting

Run commands and follow the instructions given by the manufacturer, you can start to test. During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level.

Mode	Test Frequency (MHz)											
	NCB: 20MHz											
	5180	5200	5240	5260	5280	5320	5500	5580	5700	5745	5785	5825
802.11a	17	17	17	/	/	/	/	/	/	/	/	/
802.11n-HT20	16	16	16	/	/	/	/	/	/	/	/	/
802.11ac-VHT20	15	15	15	/	/	/	/	/	/	/	/	/
802.11ax-HE20	15	15	15	/	/	/	/	/	/	/	/	/
Mode	NCB: 40MHz											
	5190	5230	5270	5310	5510	5550	5670	5710	5755	5795		
802.11n-HT40	15	15	/	/	/	/	/	/	/	/	/	/
802.11ac-VHT40	15	15	/	/	/	/	/	/	/	/	/	/
802.11ax-HE40	15	15	/	/	/	/	/	/	/	/	/	/

1.5 EUT Operating during test

EUT was programmed to be in continuously transmitting mode. During the test, EUT operation to normal function and programs under Android were executed.

1.6 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A and the CAB identifier is CN0057.

1.7 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11a	5180MHz,5200MHz,5240MHz
TM2	802.11n-HT20	5180MHz,5200MHz,5240MHz
TM3	802.11ac-VHT20	5180MHz,5200MHz,5240MHz
TM4	802.11ax-HE20	5180MHz,5200MHz,5240MHz
TM5	802.11n-HT40	5190MHz,5230MHz
TM6	802.11ac-VHT40	5190MHz,5230MHz
TM7	802.11ax-HE40	5190MHz,5230MHz

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	50~56 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Type-C cable	1.2	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Computer	Lenovo	L13 Yoga	/

1.8 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	0.57dB
Occupied Bandwidth	Conducted	0.015MHz
Power Spectral Density	Conducted	1.8dB
Conducted Spurious Emission	Conducted	2.17dB
Conducted Emissions	Conducted	9-150kHz, 3.74dB
		0.15-30MHz, 3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz, 4.52dB
		0.2-1GHz 5.56dB
		1-6GHz, 3.84dB
		6-18GHz, 3.92dB

1.9 Test Equipment List and Details

Fixed asset Number	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
WTXE1041A 1001	Communication Tester	Rohde & Schwarz	CMW500	148650	2025-02-23	2026-02-22
WTXE1005A 1005	Spectrum Analyzer	Agilent	N9020A	US471401 02	2025-02-23	2026-02-22
WTXE1084A 1001	Spectrum Analyzer	Agilent	N9020A	MY543205 48	2025-02-23	2026-02-22
WTXE1004A 1-001	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2025-02-23	2026-02-22
WTXW1105A 1010	Spectrum Analyzer	KEYSIGHT	N9020A	MY512856 77	2025-02-23	2026-02-22
WTXE1105A 1008	RF Control Unit	Tonscend	JS0806-2	24F80620 870	2025-02-23	2026-02-22
WTXE1103A 1003	Attenuator	Pasternack	PE4007-4	/	2025-02-23	2026-02-22
WTXE1003A 1-005	Coaxial Cable	/	0M4RFC	/	2025-02-23	2026-02-22
☐ Chamber A: Below 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2025-02-23	2026-02-22
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22
WTXE1007A 1002	Amplifier	HP	8447F	2805A034 75	2025-02-23	2026-02-22
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25
WTXE1010A 1006	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2025-02-23	2026-02-22
WTXE1104A 1032-1	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1032-2	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1032-3	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
☐ Chamber A: Above 1GHz						
WTXE1005A 1003	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/03 5	2025-02-23	2026-02-22
WTXE1001A 1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2025-02-23	2026-02-22

WTXE1065A 1001	Amplifier	C&D	PAP-1.0G18	14918	2025-02-23	2026-02-22
WTXE1010A 1005	Horn Antenna	ETS	3117	00086197	2025-02-23	2026-02-22
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
WTXE1104A 1033-1	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
WTXE1104A 1033-2	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
WTXE1104A 1033-3	Coaxial Cable	/	C16-07-07	/	2025-02-23	2026-02-22
☐ Chamber B:Below 1GHz						
WTXE1010A 1006	Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-635	2024-03-17	2027-03-16
WTXE1038A 1001	Amplifier	Agilent	8447D	2944A104 57	2025-02-23	2026-02-22
WTXE1001A 1002	EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2025-02-23	2026-02-22
WTXE1104A 1031-1	Coaxial Cable	/	1.5MRFC-LWB3	/	2025-02-23	2026-02-22
WTXE1104A 1031-2	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
WTXE1104A 1031-3	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
☒ Chamber C:Below 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22
WTXE1010A 1013-1	Trilog Broadband Antenna	Schwarz beck	VULB 9168	1194	2024-04-18	2027-04-17
WTXE1010A 1007	Loop Antenna	Schwarz beck	FMZB 1516	9773	2024-02-26	2026-02-25
WTXE1007A 1003	Amplifier	HP	8447F	2944A038 69	2025-02-23	2026-02-22
WTXE1104A 1034-1	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1034-2	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22

WTXE1104A 1034-3	Coaxial Cable	/	RC_6G-N-M	/	2025-02-23	2026-02-22
☒ Chamber C: Above 1GHz						
WTXE1093A 1001	EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2025-02-23	2026-02-22
WTXE1103A 1005	Horn Antenna	POAM	RTF-118A	1820	2025-06-13	2027-06-12
WTXE1103A 1006	Amplifier	Tonscend	TAP01018050	AP22E806 235	2025-02-23	2026-02-22
WTXE1010A 1010	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2024-03-17	2026-03-16
WTXE1003A 1001	Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2025-02-23	2026-02-22
WTXE1104A 1035-1	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1035-2	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
WTXE1104A 1035-3	Coaxial Cable	/	RC-18G-N-M	/	2025-02-23	2026-02-22
☐ Conducted Room 1#						
WTXE1104A 1029	EMI Test Receiver	Rohde & Schwarz	ESCI	100525	2024-12-08	2025-12-07
WTXE1002A 1001	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2025-02-23	2026-02-22
WTXE1003A 1001	AC LISN	Schwarz beck	NSLK8126	8126-279	2025-02-23	2026-02-22
WTXE1104A 1036	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22
WTXE1104A 1038	Coaxial Cable	/	6MRFC-DP	/	2025-02-23	2026-02-22
☒ Conducted Room 2#						
WTXE1001A 1004	EMI Test Receiver	Rohde & Schwarz	ESPI	101259	2025-02-23	2026-02-22
WTXE1003A 1003	LISN	Rohde & Schwarz	ENV 216	100097	2025-02-23	2026-02-22
WTXE1104A 1037	Coaxial Cable	/	RG 316	/	2025-02-23	2026-02-22

Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission A)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission B)	Farad	EZ-EMC	RA-03A1 (1.1.4.2)
EMI Test Software (Radiated Emission C)	Farad	EZ-EMC	RA-03A1-2 (1.1.4.2)
EMI Test Software (Conducted Emission Room 1#)	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3
EMI Test Software (Conducted Emission Room 2#)	Farad	EZ-EMC	3A1*CE-RE 1.1.4.3
RF Test System	Tonscend	JS1120-3	V3.5.39

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§15.203; §15.405	Antenna Requirement	Compliant
15.407 (c)	Automatically Discontinue Transmission	Compliant
§15.207; §15.407(b)(6)	Conducted Emission	Compliant
§15.407(a)(1),(2)	Power Spectral Density	Compliant
§15.407(e)	Emission Bandwidth and Occupied Bandwidth	Compliant
§15.407(a)(1),(2)	Maximum Conducted Output Power	Compliant
§15.407(b)(1),(2),(3),(4)	Undesirable emission	Compliant
§15.205; §15.209; §15.407(b)(1),(2),(3)	Radiated Emission	Compliant
§15.407(g)	Frequency Stability	Compliant
§15.407(h)	Dynamic Frequency Selection (DFS)	Compliant

N/A: Not applicable.

3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 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.

3.2 Evaluation Information

This product has a FPC antenna, fulfill the requirement of this section.

4. Automatically Discontinue Transmission

4.1 Standard Applicable

According to FCC Part 15.407(c), the device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

4.2 Summary of Test Results

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

5. Power Spectral Density

5.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.

(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or $11 \text{ dBm} + 10 \log B$, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2 Test Procedure

According to 789033 D02 v02r01 General UNII Test Procedures New Rules v02, the following is the measurement procedure.

For devices operating in the bands 5.15-5.25GHz, 5.25-5.35GHz, and 5.47-5.725GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85GHz, the rules specify a measurement bandwidth of 500kHz. Many spectrum analyzers do not have 500kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500kHz, "provided that the measured power is integrated over the full

reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1MHz, or 500kHz). If measurements are performed using a reduced resolution bandwidth ($< 1\text{MHz}$, or $< 500\text{kHz}$) and integrated over 1 MHz, or 500kHz bandwidth, the following adjustments to the procedures apply:

- a) Set $\text{RBW} \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $\text{VBW} \geq 3 \text{ RBW}$.
- c) If measurement bandwidth of Maximum PSD is specified in 500kHz, add $10\log(500\text{kHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 500\text{kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 1\text{MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100kHz for the sections 5.c) and 5.d) above, since $\text{RBW}=100\text{kHz}$ is available on nearly all spectrum analyzers.

5.3 Summary of Test Results/Plots

Please refer to Appendix D

6. Emission Bandwidth and Occupied Bandwidth

6.1 Standard Applicable

According to 15.407(a) and (e):

(1) For the band 5.15-5.25GHz.

(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or $11\text{dBm} + 10 \log B$, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85GHz band, the minimum 6dB bandwidth of U-NII devices shall be at least 500kHz.

6.2 Test Procedure

According to 789033 D02 v02r0r section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.

- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85GHz Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v02r01 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

- 1. Set center frequency to the nominal EUT channel center frequency.
- 2. Set span = 1.5 times to 5.0 times the OBW.
- 3. Set RBW = 1 % to 5 % of the OBW
- 4. Set VBW $\geq 3 \times$ RBW
- 5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- 6. Use the 99 % power bandwidth function of the instrument (if available).
- 7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

Reference No.: WTX25X10271254W001

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

6.3 Summary of Test Results/Plots

Please refer to Appendix A1&A2

7. Maximum Conducted Output Power

7.1 Standard Applicable

Section 15.407(a) Power limits:

(1) For the band 5.15-5.25GHz.

(iv) For mobile and portable client devices in the 5.15-5.25GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(2) For the 5.25-5.35GHz and 5.47-5.725GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

(3) For the band 5.725-5.85GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

7.2 Test Procedure

According to KDB789033 D02 v02r01 section E, the following is the measurement procedure.

- (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (ii) Set RBW = 1MHz.
- (iii) Set VBW $\geq$ 3MHz.
- (iv) Number of points in sweep $\geq$ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that

narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle $\geq$ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

7.3 Summary of Test Results/Plots

Please refer to Appendix C

8. Radiated Spurious Emissions

8.1 Standard Applicable

According to §15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35GHz band: All emissions outside of the 5.15-5.35GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725GHz band: All emissions outside of the 5.47-5.725GHz band shall not exceed an e.i.r.p. of -27dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85GHz band:
 - (i) All emissions shall be limited to a level of -27dBm/MHz at 75MHz or more above or below the band edge increasing linearly to 10dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band edge increasing linearly to a level of 27dBm/MHz at the band edge.

According to §15.407(b)(6), Unwanted emissions below 1GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

According to §15.407(b)(7), The provisions of §15.205 apply to intentional radiators operating under this section.

789033 D02 v02r01 General UNII Test Procedures New Rules v01

If radiated measurements are performed, field strength is then converted to EIRP as follows:

$$\text{EIRP} = ((E \cdot d)^2) / 30$$

where:

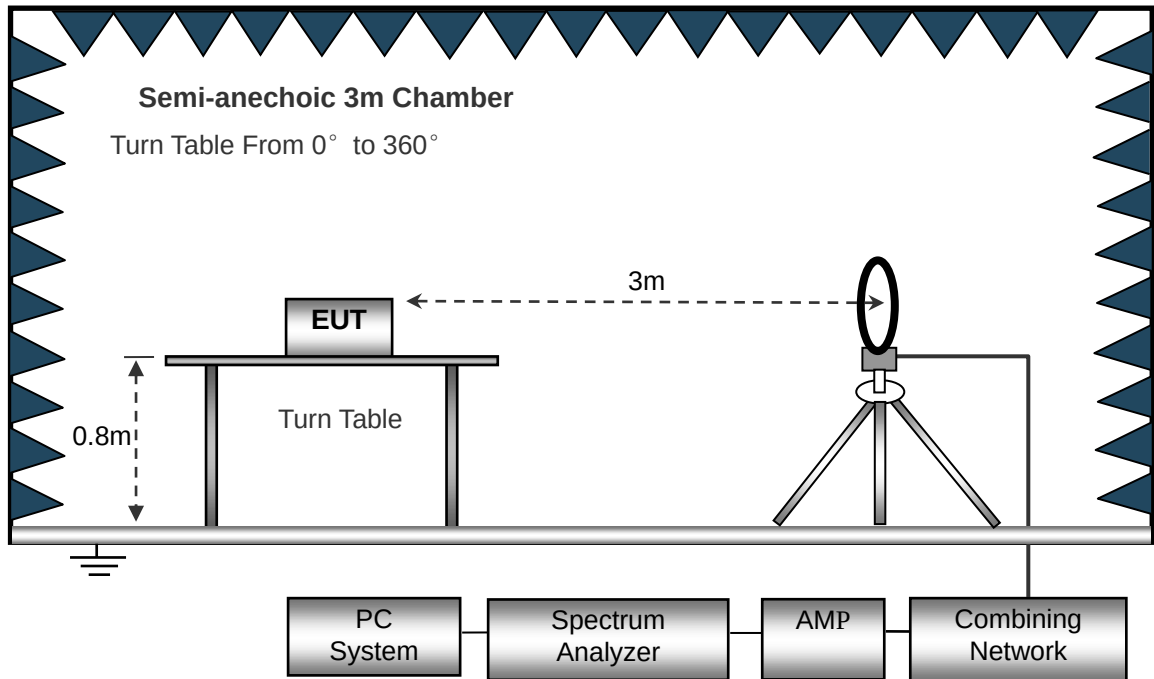
- E is the field strength in V/m;
- d is the measurement distance in meters;
- EIRP is the equivalent isotropically radiated power in watts.

8.2 Test Procedure

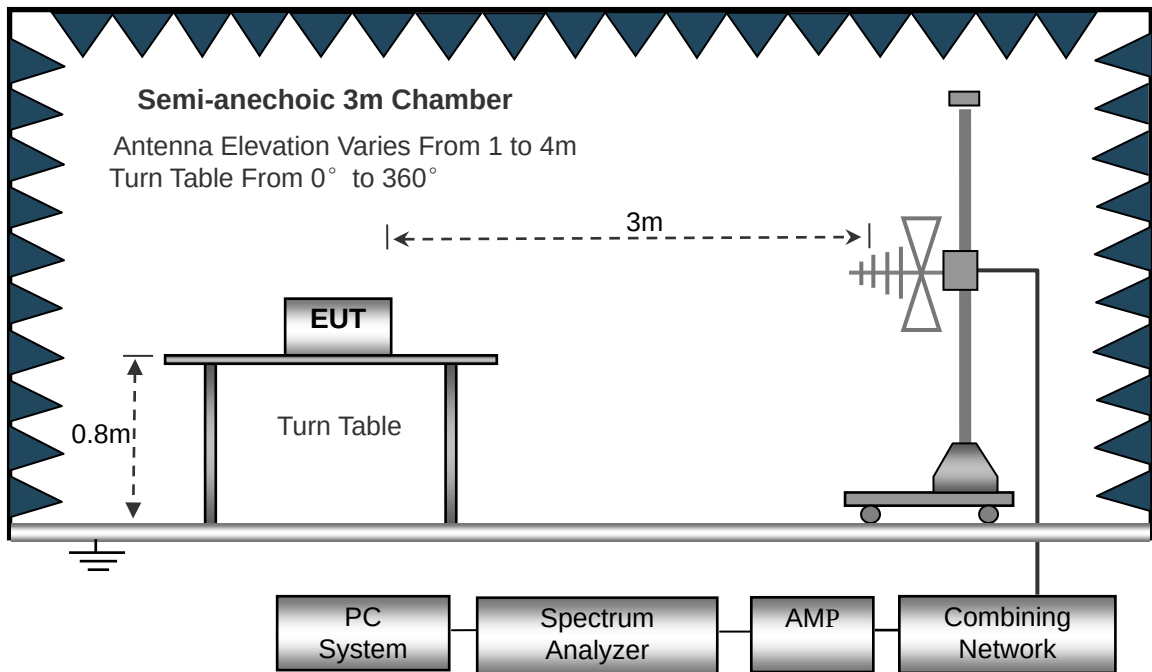
The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.205 15.407(b)(6) and FCC Part 15.209 Limit..

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

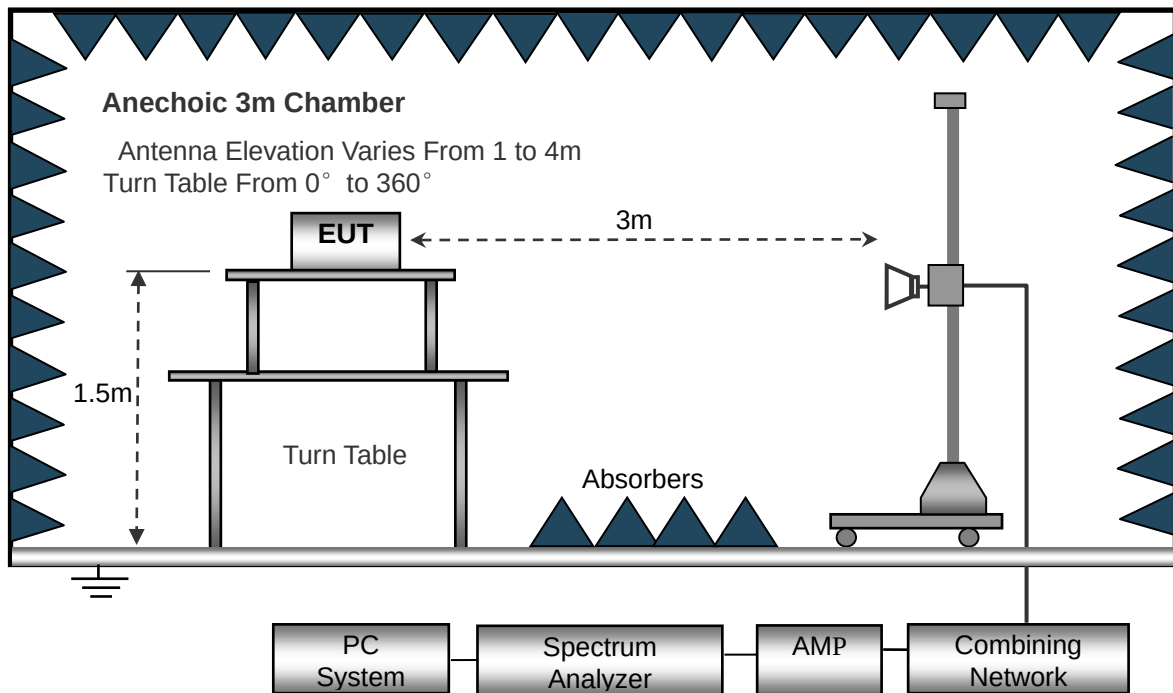
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30MHz to 1GHz.



The test setup for emission measurement above 1GHz.



8.3 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

8.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

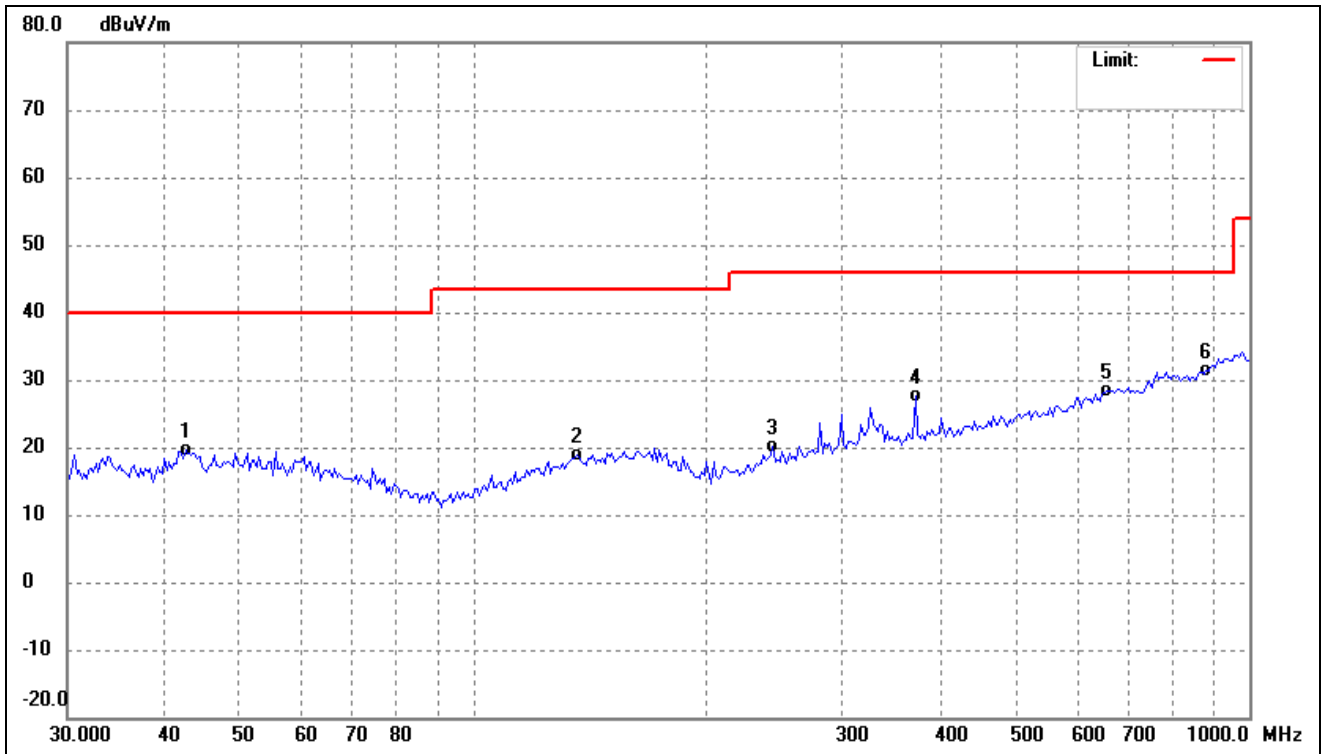
8.5 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

- Spurious Emission From 30MHz to 1GHz
- 5150-5250MHz

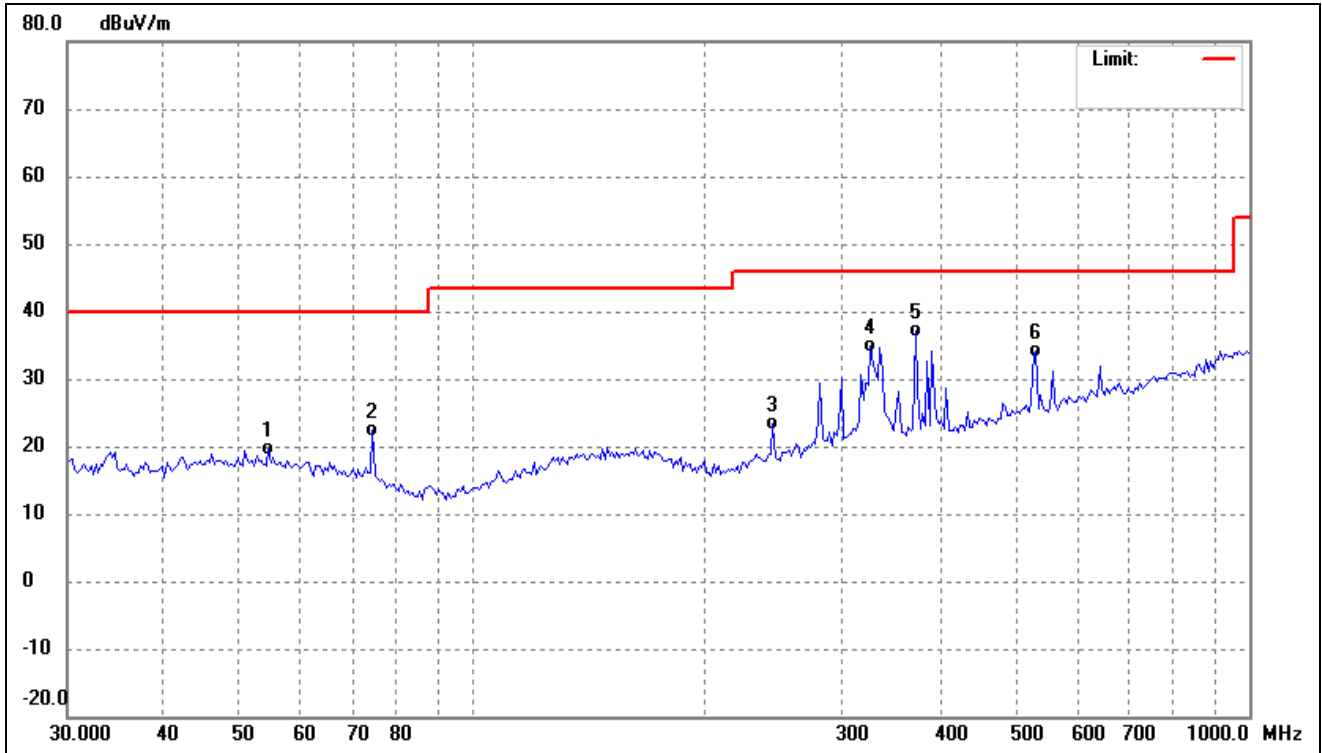
802.11a(worst case)

Test Channel	5180MHz(worst case)	Polarity:	Horizontal
--------------	---------------------	-----------	------------



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	42.6299	28.99	-9.30	19.69	40.00	-20.31	-	-	QP
2	135.9163	28.36	-9.60	18.76	43.50	-24.74	-	-	QP
3	243.5431	29.91	-9.83	20.08	46.00	-25.92	-	-	QP
4	371.2680	34.36	-6.66	27.70	46.00	-18.30	-	-	QP
5	655.9766	29.74	-1.30	28.44	46.00	-17.56	-	-	QP
6	881.1838	29.89	1.58	31.47	46.00	-14.53	-	-	QP

802.11a(worst case)			
Test Channel	5180MHz(worst case)	Polarity:	Vertical

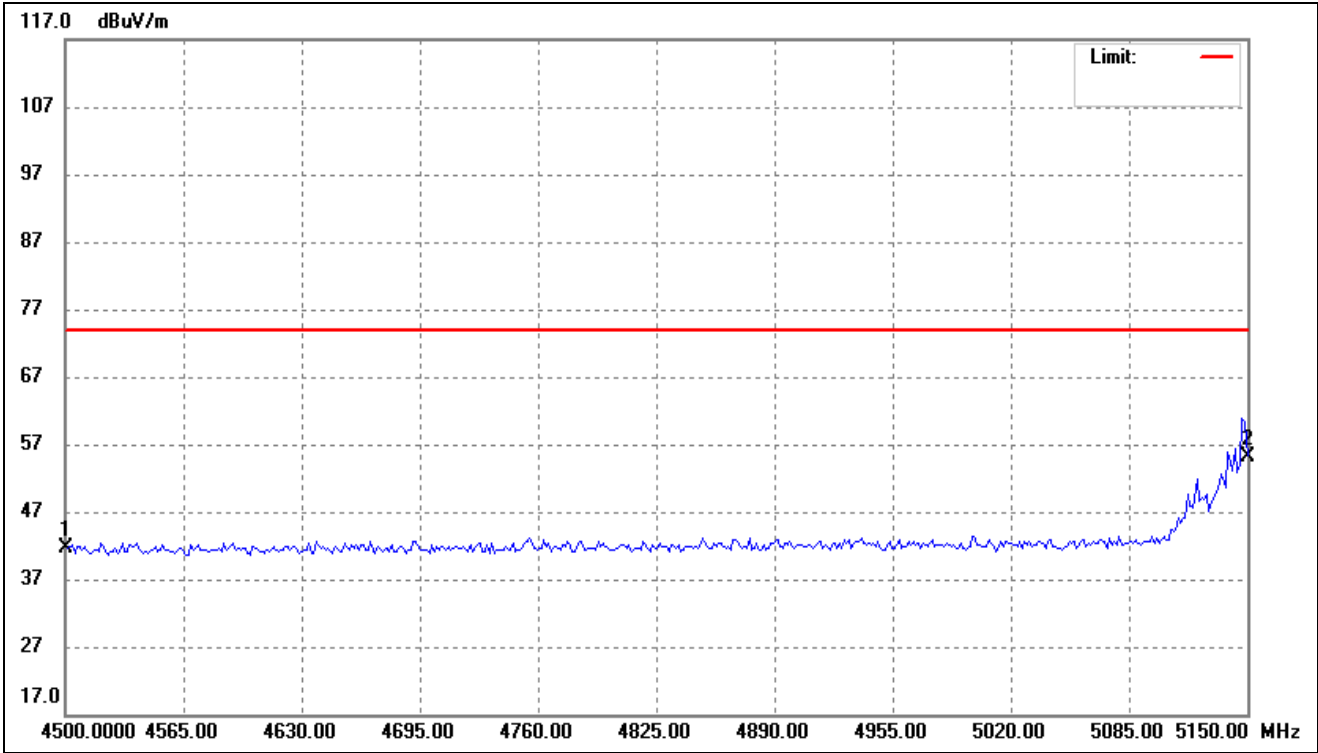


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	54.5167	28.82	-9.17	19.65	40.00	-20.35	-	-	QP
2	74.2696	34.20	-11.92	22.28	40.00	-17.72	-	-	QP
3	243.5431	33.32	-9.83	23.49	46.00	-22.51	-	-	QP
4	324.8645	42.02	-7.18	34.84	46.00	-11.16	-	-	QP
5	371.2680	43.88	-6.66	37.22	46.00	-8.78	-	-	QP
6	531.2910	37.85	-3.80	34.05	46.00	-11.95	-	-	QP

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

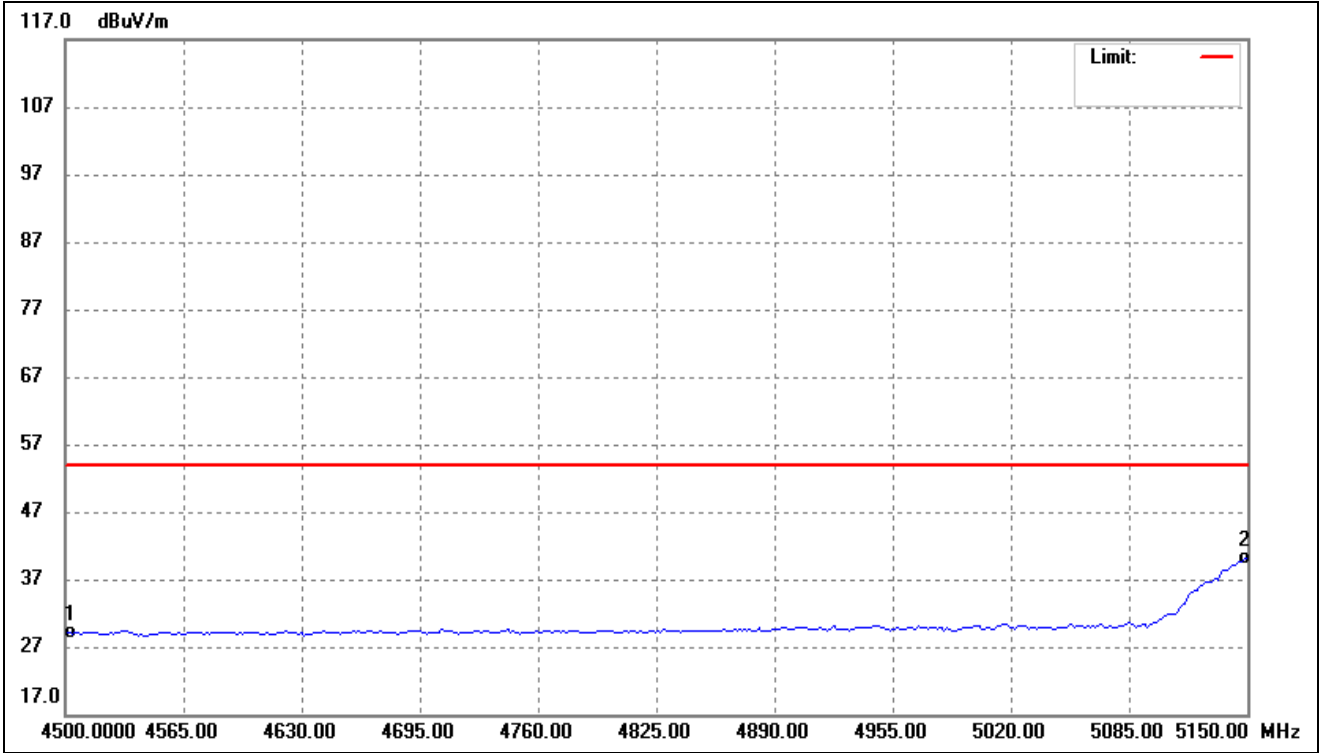
➤ Spurious Emission above 1GHz

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



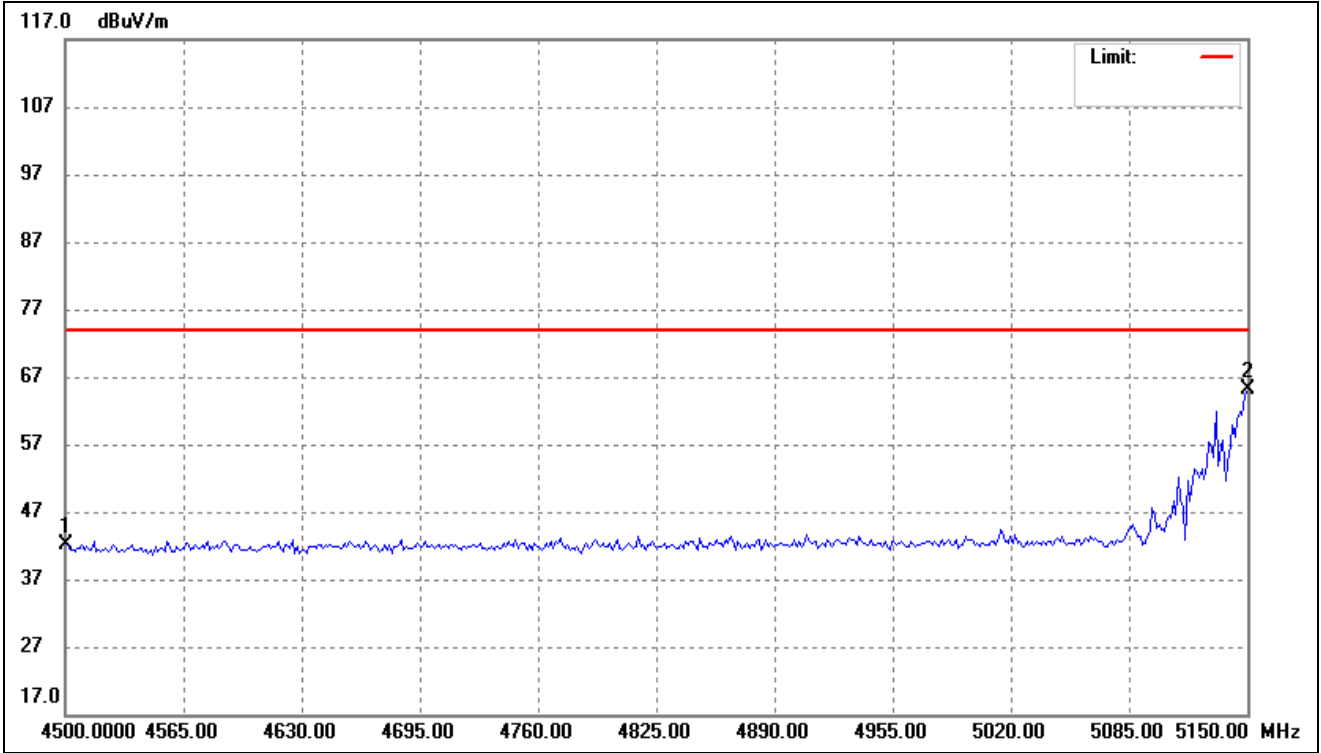
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	55.22	-13.60	41.62	74.00	-32.38	-	-	peak
2	5150.000	67.46	-12.21	55.25	74.00	-18.75	-	-	peak

802.11a- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



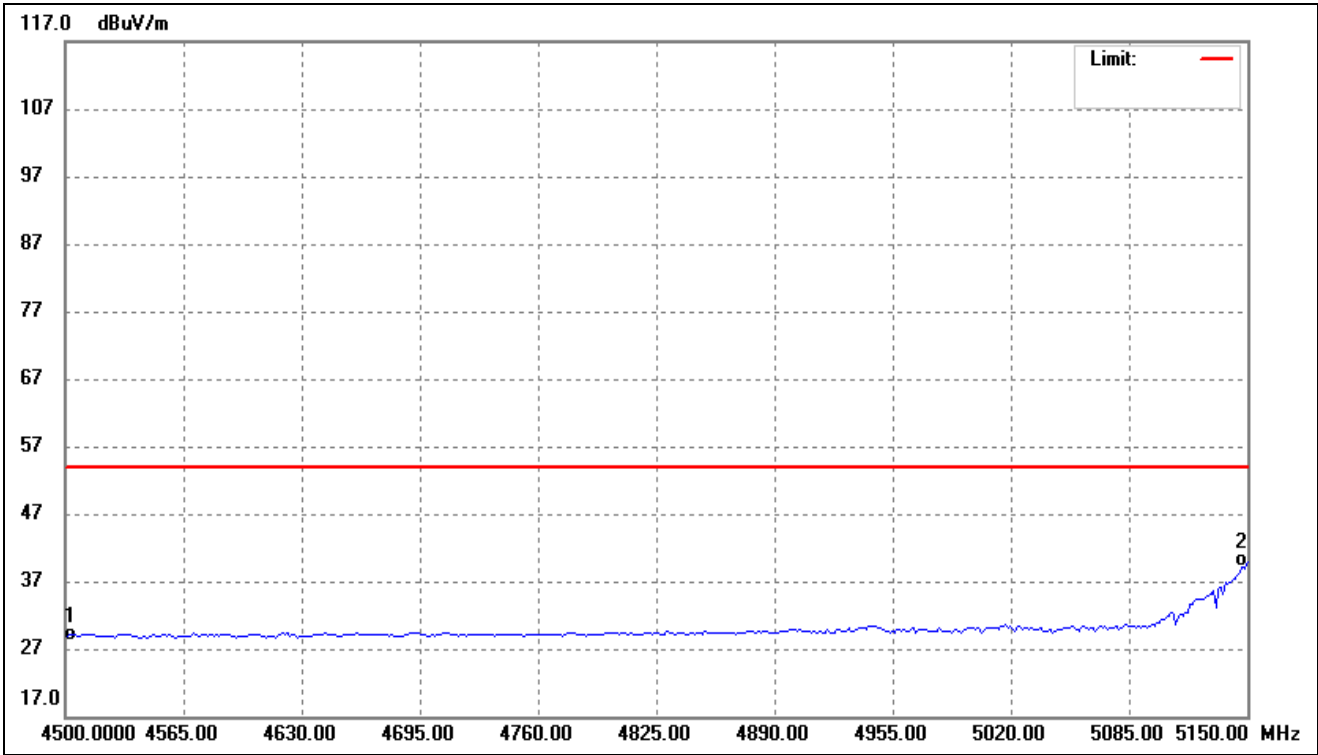
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	42.63	-13.60	29.03	54.00	-24.97	-	-	AVG
2	5150.000	52.39	-12.21	40.18	54.00	-13.82	-	-	AVG

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



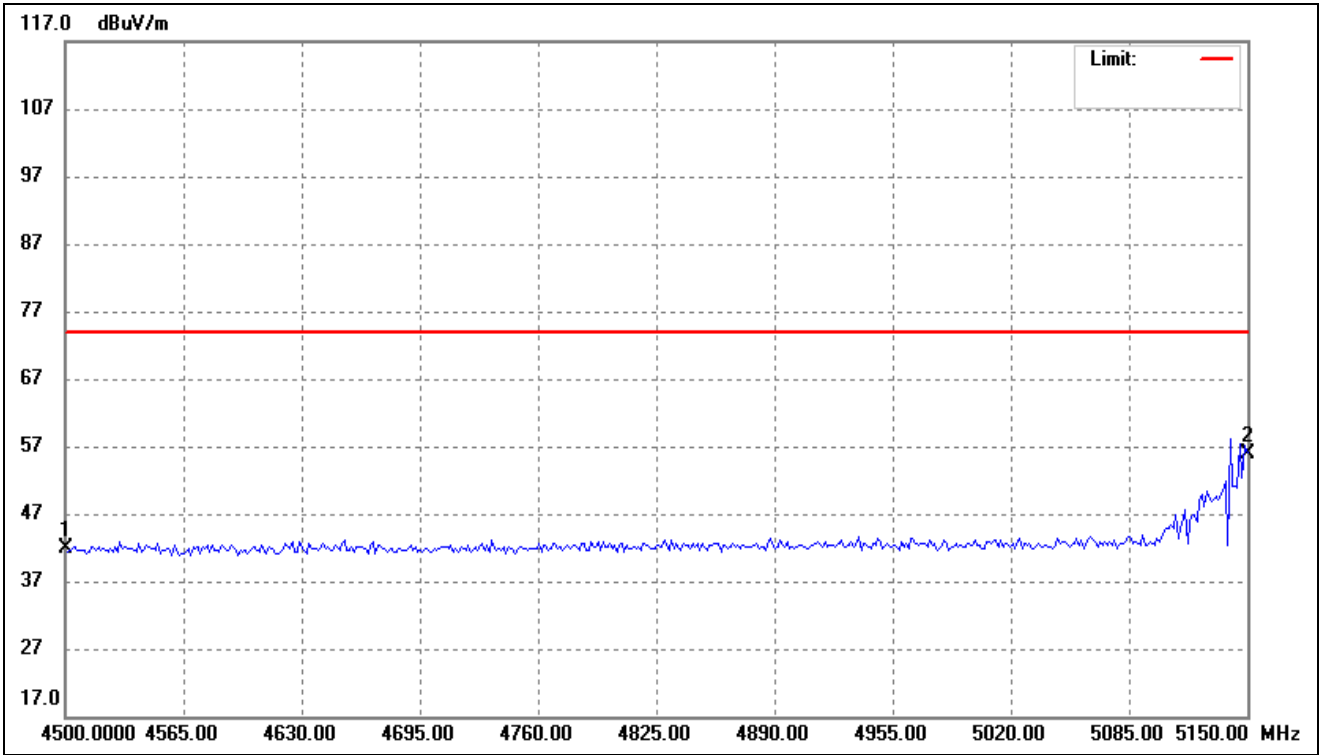
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	55.72	-13.60	42.12	74.00	-31.88	-	-	peak
2	5150.000	77.37	-12.21	65.16	74.00	-8.84	-	-	peak

802.11n-HT20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



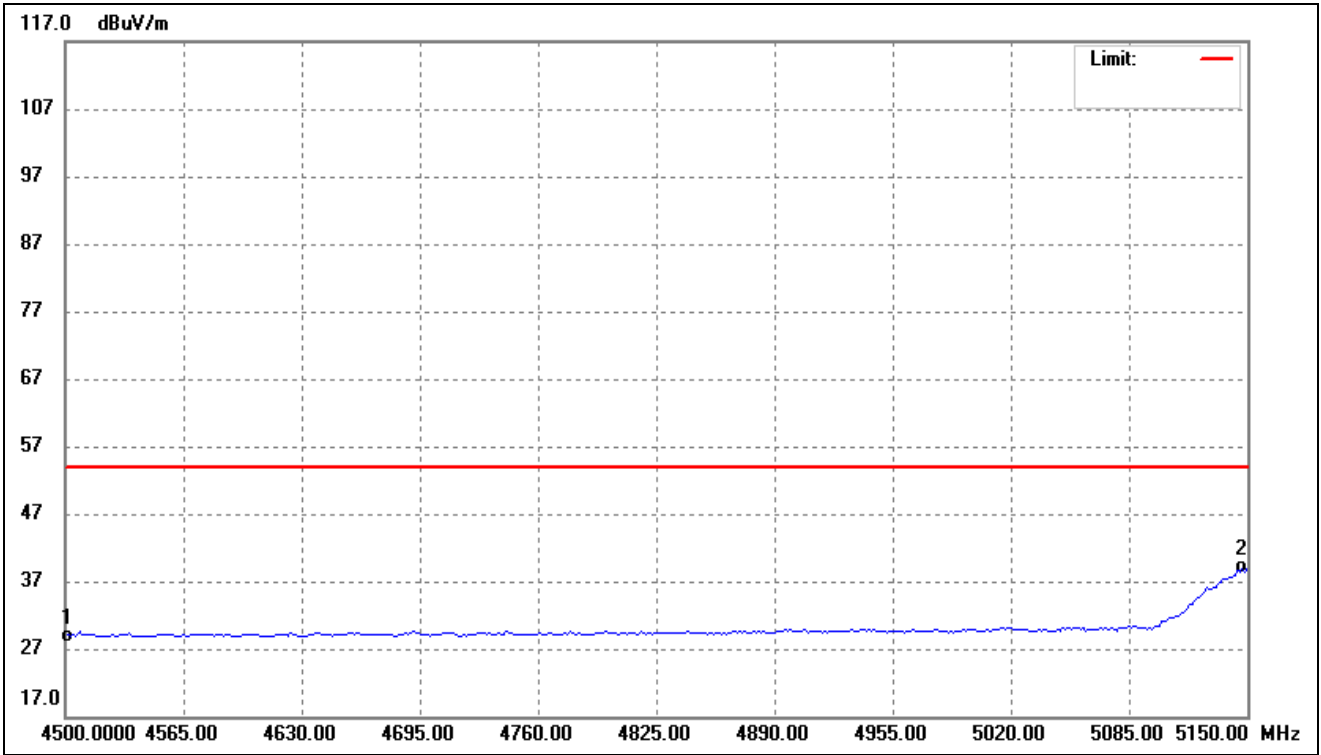
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	42.66	-13.60	29.06	54.00	-24.94	-	-	AVG
2	5150.000	52.29	-12.21	40.08	54.00	-13.92	-	-	AVG

802.11ax-HE20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



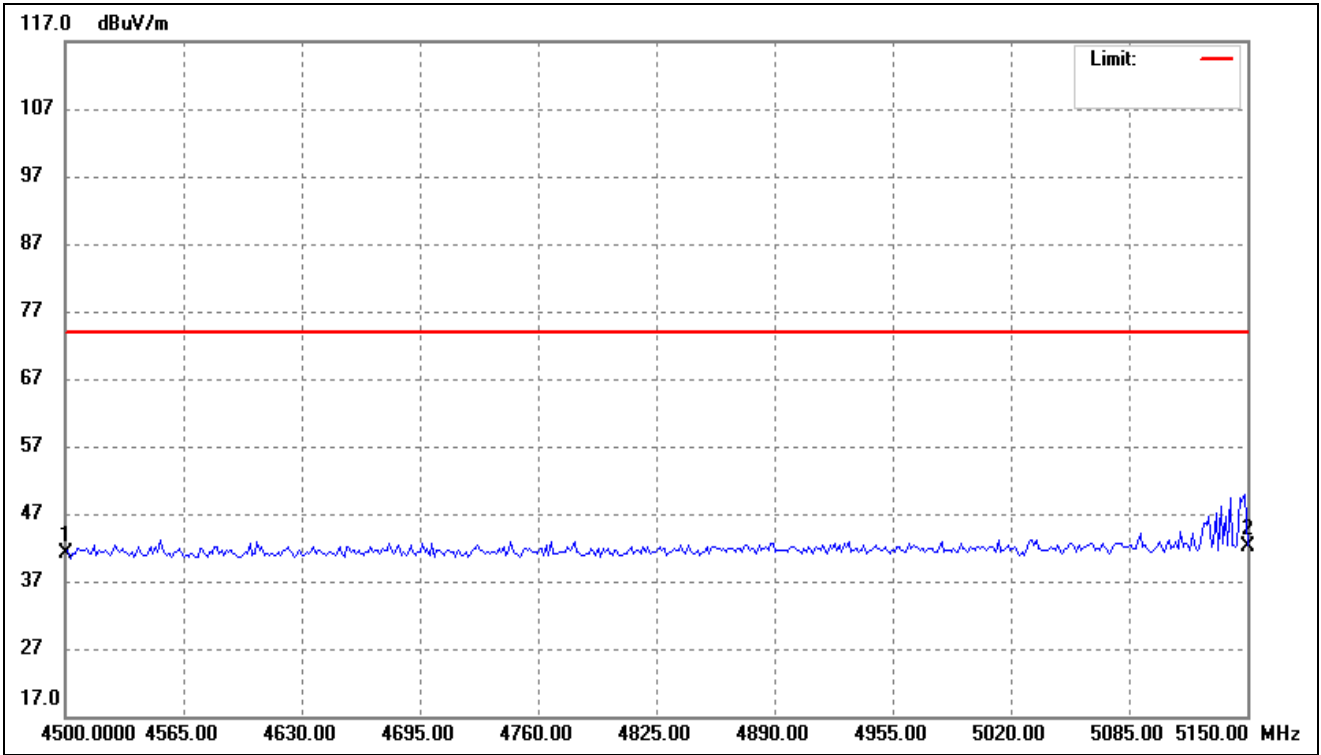
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	55.59	-13.60	41.99	74.00	-32.01	-	-	peak
2	5150.000	68.02	-12.21	55.81	74.00	-18.19	-	-	peak

802.11ax-HE20- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



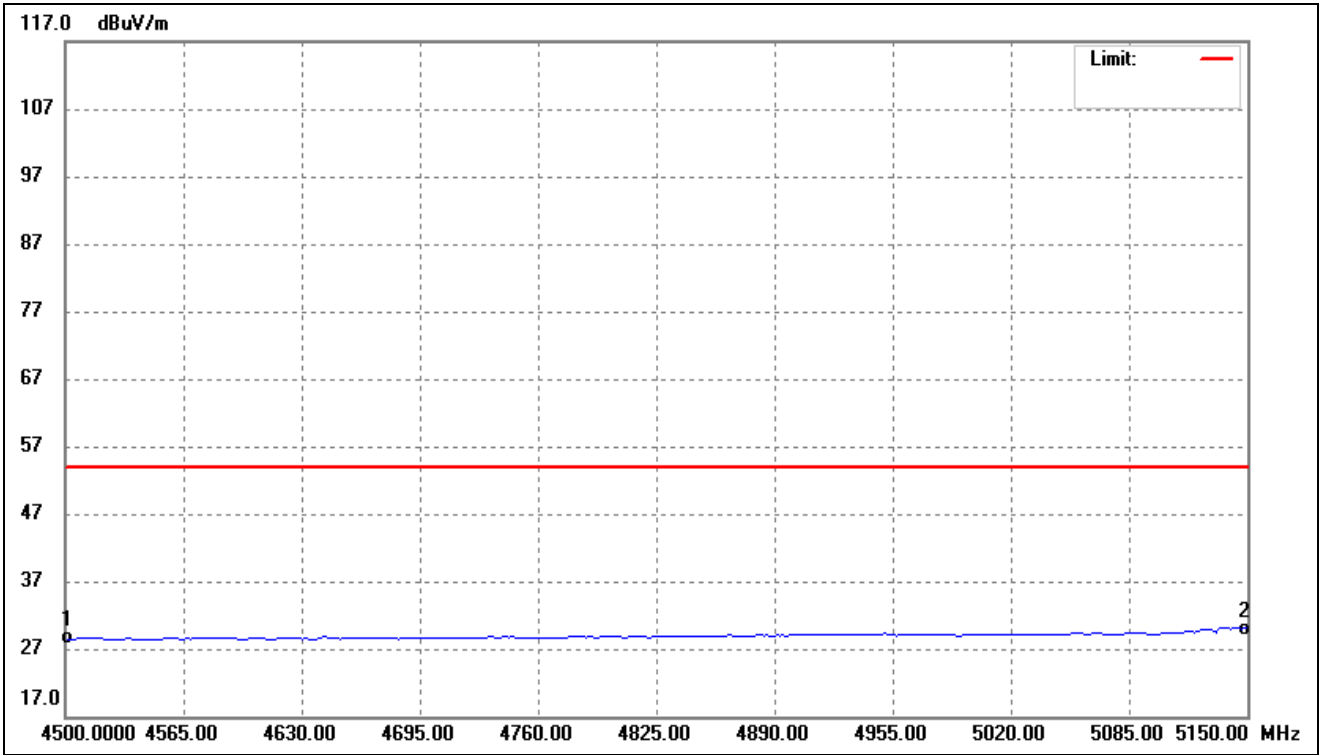
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	42.50	-13.60	28.90	54.00	-25.10	-	-	AVG
2	5150.000	51.42	-12.21	39.21	54.00	-14.79	-	-	AVG

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



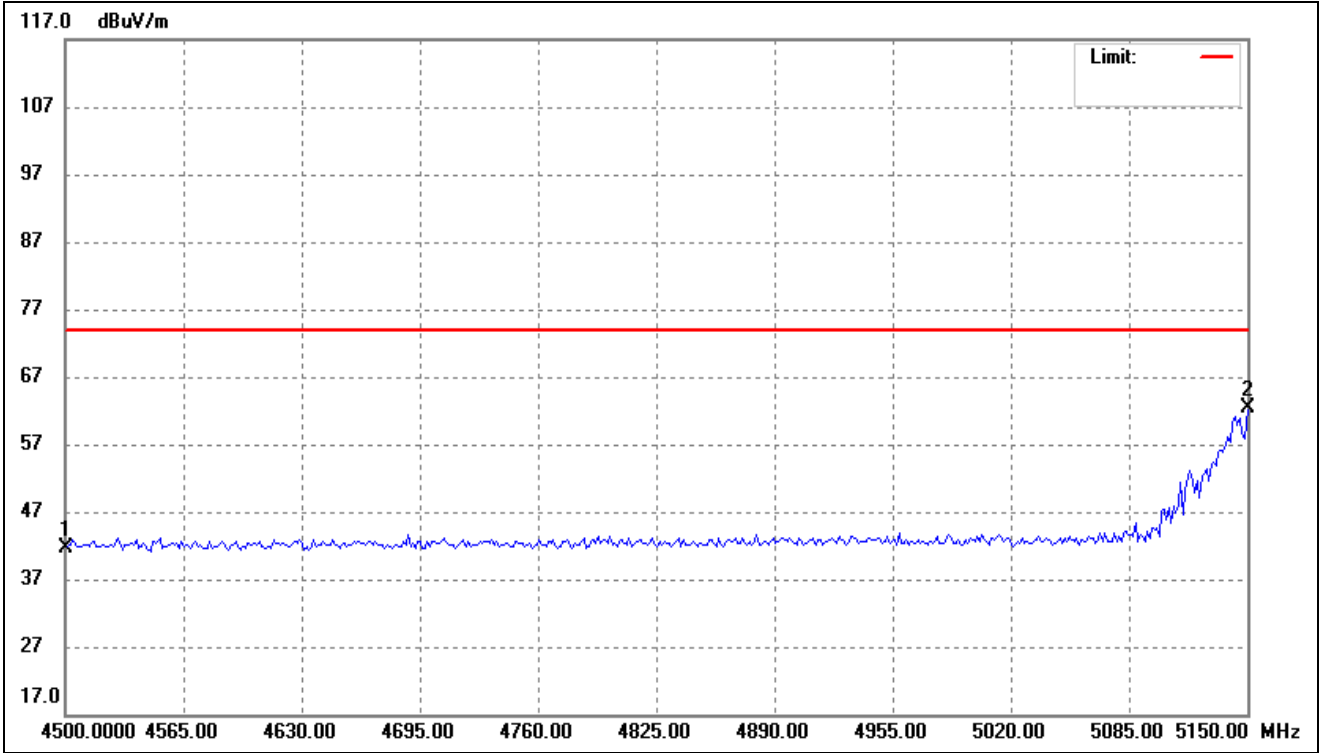
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	54.78	-13.60	41.18	74.00	-32.82	-	-	peak
2	5150.000	54.36	-12.21	42.15	74.00	-31.85	-	-	peak

802.11n-HT40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



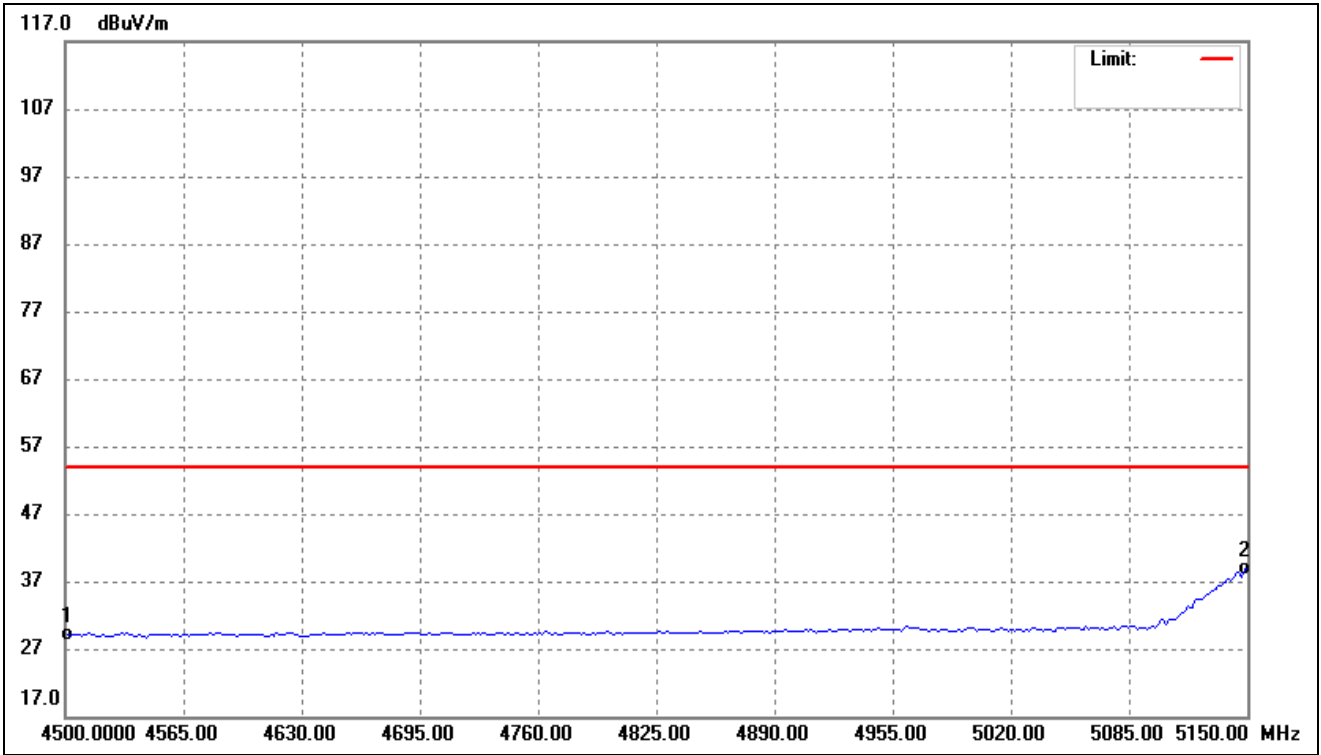
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	42.11	-13.60	28.51	54.00	-25.49	-	-	AVG
2	5150.000	42.10	-12.21	29.89	54.00	-24.11	-	-	AVG

802.11ax-HE40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	55.27	-13.60	41.67	74.00	-32.33	-	-	peak
2	5150.000	74.53	-12.21	62.32	74.00	-11.68	-	-	peak

802.11ax-HE40- Restricted Bandedge			
Test Channel	band 5.15-5.25GHz	Polarity:	Vertical(worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	4500.000	42.71	-13.60	29.11	54.00	-24.89	-	-	AVG
2	5150.000	51.01	-12.21	38.80	54.00	-15.20	-	-	AVG

Note: The Restricted Bandedge was tested in Horizontal /Vertical and the worst case position data was reported.

Remark: '-'Means' the test Degree and Height is not recorded by the test software and only show the worst case in the test report.

- For the frequency band 5.15-5.25GHz(802.11a)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5180MHz)							
10360	45.75	-4.22	41.53	74	-32.47	H	PK
10360	43.84	-4.22	39.62	54	-14.38	H	AV
10360	48.09	-4.22	43.87	74	-30.13	V	PK
10360	46.00	-4.22	41.78	54	-12.22	V	AV
Middle Channel (5200MHz)							
10400	46.03	-4.19	41.84	74	-32.16	H	PK
10400	43.38	-4.19	39.19	54	-14.81	H	AV
10400	48.50	-4.19	44.31	74	-29.69	V	PK
10400	45.63	-4.19	41.44	54	-12.56	V	AV
High Channel (5240MHz)							
10480	46.34	-4.16	42.18	74	-31.82	H	PK
10480	43.32	-4.16	39.16	54	-14.84	H	AV
10480	48.56	-4.16	44.40	74	-29.60	V	PK
10480	45.18	-4.16	41.02	54	-12.98	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-33.34	-27
Highest	Above 5350	-39.94	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz (802.11n HT20)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5180MHz)							
10360	46.49	-4.22	42.27	74	-31.73	H	PK
10360	43.56	-4.22	39.34	54	-14.66	H	AV
10360	47.78	-4.22	43.56	74	-30.44	V	PK
10360	45.96	-4.22	41.74	54	-12.26	V	AV
Middle Channel (5200MHz)							
10400	46.55	-4.19	42.36	74	-31.64	H	PK
10400	44.02	-4.19	39.83	54	-14.17	H	AV
10400	48.73	-4.19	44.54	74	-29.46	V	PK
10400	45.13	-4.19	40.94	54	-13.06	V	AV
High Channel (5240MHz)							
10480	46.24	-4.16	42.08	74	-31.92	H	PK
10480	43.23	-4.16	39.07	54	-14.93	H	AV
10480	48.06	-4.16	43.90	74	-30.10	V	PK
10480	45.59	-4.16	41.43	54	-12.57	V	AV

- Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-34.28	-27
Highest	Above 5350	-41.44	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz(802.11ac VHT20)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5180MHz)							
10360	44.36	-4.22	40.14	74	-33.86	H	PK
10360	41.43	-4.22	37.21	54	-16.79	H	AV
10360	47.92	-4.22	43.70	74	-30.30	V	PK
10360	45.58	-4.22	41.36	54	-12.64	V	AV
Middle Channel (5200MHz)							
10400	43.78	-4.19	39.59	74	-34.41	H	PK
10400	41.00	-4.19	36.81	54	-17.19	H	AV
10400	47.70	-4.19	43.51	74	-30.49	V	PK
10400	45.45	-4.19	41.26	54	-12.74	V	AV
High Channel (5240MHz)							
10480	44.24	-4.16	40.08	74	-33.92	H	PK
10480	41.06	-4.16	36.90	54	-17.10	H	AV
10480	47.62	-4.16	43.46	74	-30.54	V	PK
10480	45.67	-4.16	41.51	54	-12.49	V	AV

- Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-34.43	-27
Highest	Above 5350	-38.48	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz(802.11ax HE20)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5180MHz)							
10360	44.31	-4.22	40.09	74	-33.91	H	PK
10360	40.77	-4.22	36.55	54	-17.45	H	AV
10360	48.35	-4.22	44.13	74	-29.87	V	PK
10360	45.31	-4.22	41.09	54	-12.91	V	AV
Middle Channel (5200MHz)							
10400	44.13	-4.19	39.94	74	-34.06	H	PK
10400	41.17	-4.19	36.98	54	-17.02	H	AV
10400	48.26	-4.19	44.07	74	-29.93	V	PK
10400	45.82	-4.19	41.63	54	-12.37	V	AV
High Channel (5240MHz)							
10480	44.14	-4.16	39.98	74	-34.02	H	PK
10480	41.51	-4.16	37.35	54	-16.65	H	AV
10480	48.26	-4.16	44.10	74	-29.90	V	PK
10480	45.88	-4.16	41.72	54	-12.28	V	AV

- Out of Band edge 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-36.03	-27
Highest	Above 5350	-44.04	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz (802.11n HT40)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5190MHz)							
10380	44.49	-4.21	40.28	74	-33.72	H	PK
10380	41.07	-4.21	36.86	54	-17.14	H	AV
10380	47.78	-4.21	43.57	74	-30.43	V	PK
10380	45.82	-4.21	41.61	54	-12.39	V	AV
High Channel (5230MHz)							
10460	44.07	-4.17	39.90	74	-34.10	H	PK
10460	41.11	-4.17	36.94	54	-17.06	H	AV
10460	48.25	-4.17	44.08	74	-29.92	V	PK
10460	45.32	-4.17	41.15	54	-12.85	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-32.67	-27
Highest	Above 5350	-39.14	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz (802.11ac VHT40)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5190MHz)							
10380	44.09	-4.21	39.88	74	-34.12	H	PK
10380	41.24	-4.21	37.03	54	-16.97	H	AV
10380	47.87	-4.21	43.66	74	-30.34	V	PK
10380	45.36	-4.21	41.15	54	-12.85	V	AV
High Channel (5230MHz)							
10460	43.75	-4.17	39.58	74	-34.42	H	PK
10460	41.37	-4.17	37.20	54	-16.80	H	AV
10460	48.53	-4.17	44.36	74	-29.64	V	PK
10460	45.42	-4.17	41.25	54	-12.75	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-31.57	-27
Highest	Above 5350	-38.89	-27
Note: the data just list the worst cases			

- For the frequency band 5.15-5.25GHz (802.11ax HE40)
- Harmonics And Spurious Emissions

Frequency (MHz)	Reading (dBuV/m)	Correct dB	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Polar H/V	Detector
Low Channel (5190MHz)							
10380	44.24	-4.21	40.03	74	-33.97	H	PK
10380	40.95	-4.21	36.74	54	-17.26	H	AV
10380	48.45	-4.21	44.24	74	-29.76	V	PK
10380	45.77	-4.21	41.56	54	-12.44	V	AV
High Channel (5230MHz)							
10460	44.35	-4.17	40.18	74	-33.82	H	PK
10460	40.76	-4.17	36.59	54	-17.41	H	AV
10460	48.28	-4.17	44.11	74	-29.89	V	PK
10460	45.30	-4.17	41.13	54	-12.87	V	AV

- Out of Band edge for 5150-5250MHz

Test CH.	Test Segment	Result	Limit
	MHz	dBm/MHz	dBm/MHz
Lowest	Below 5150	-32.24	-27
Highest	Above 5350	-36.13	-27
Note: the data just list the worst cases			

Note: Testing is carried out with frequency rang 9kHz to 40Ghz, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Frequency Stability

9.1 Standard Applicable

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

9.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

9.3 Summary of Test Results/Plots

Please refer to Appendix D

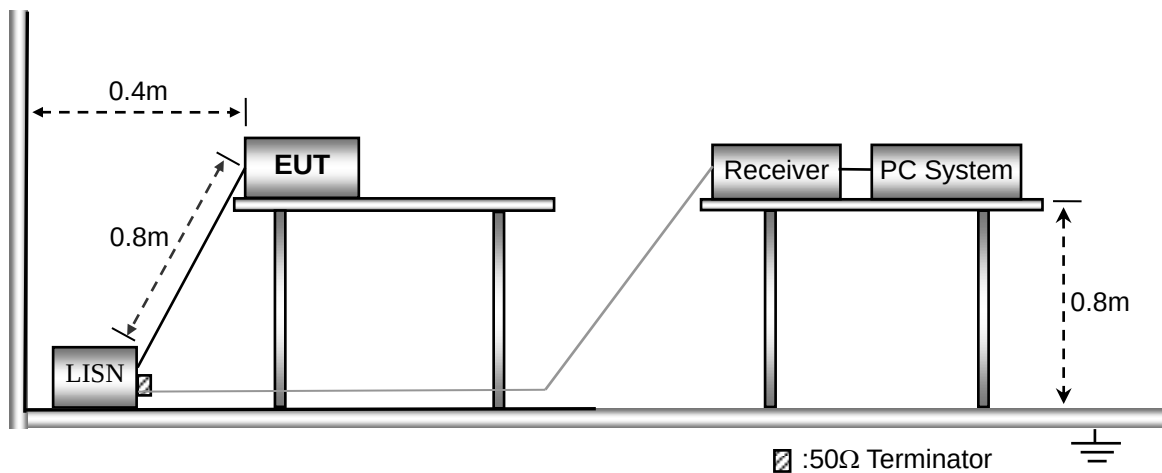
10. Conducted Emissions

10.1 Test Procedure

The setup of EUT is according with per ANSI C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

10.2 Basic Test Setup Block Diagram



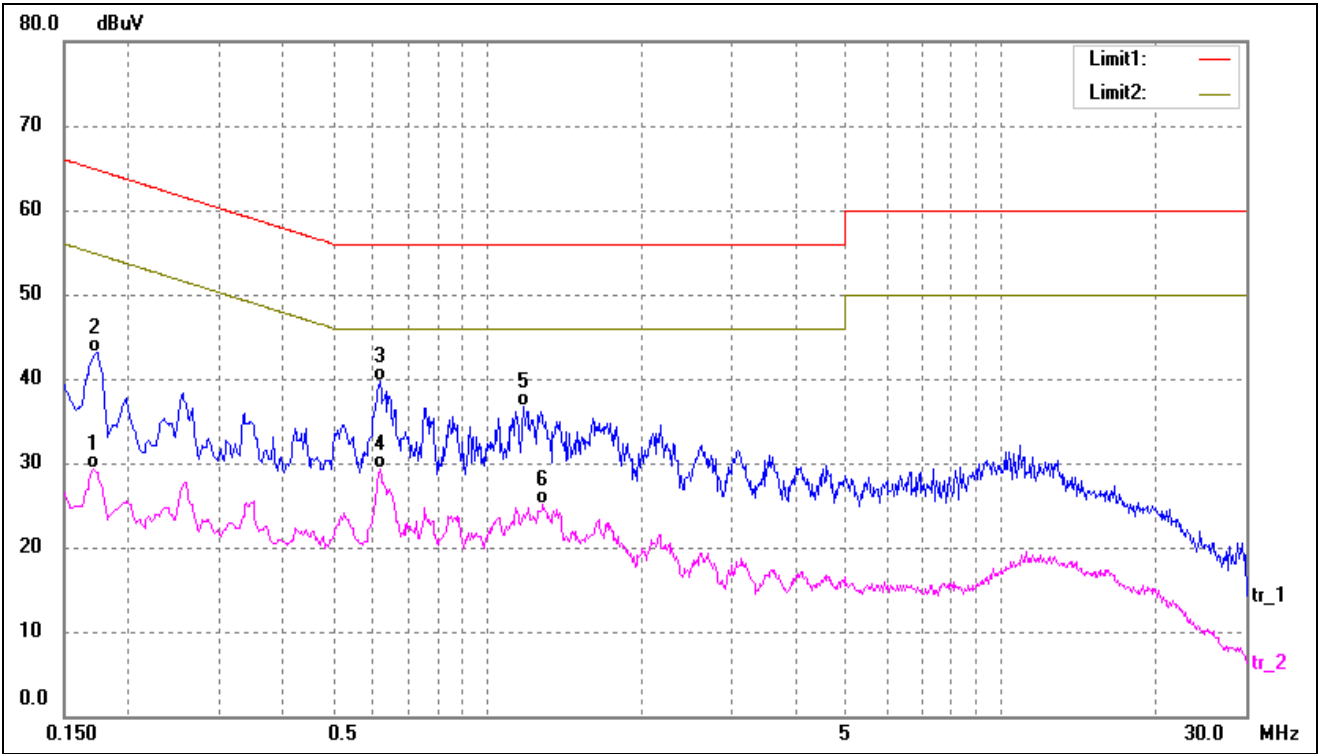
10.3 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency	150kHz
Stop Frequency	30MHz
Sweep Speed	Auto
IF Bandwidth.....	10kHz
Quasi-Peak Adapter Bandwidth	9kHz
Quasi-Peak Adapter Mode	Normal

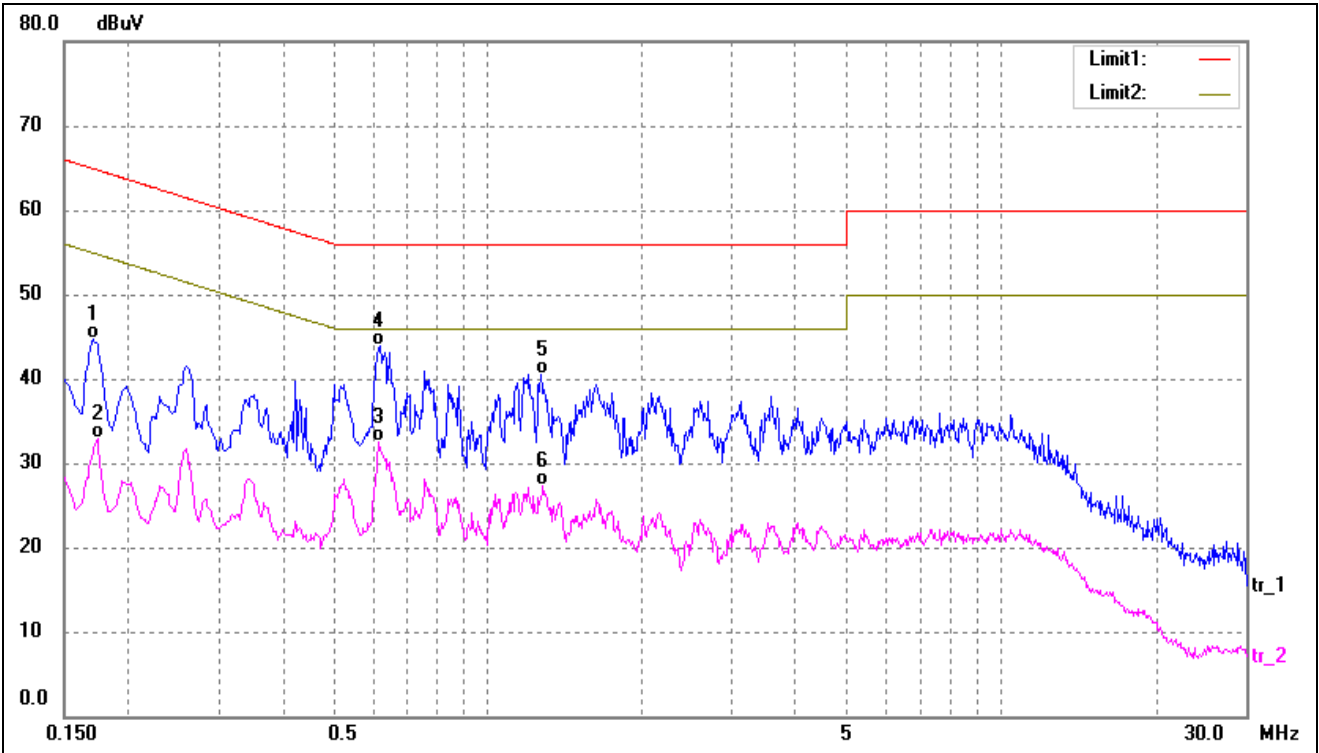
10.4 Summary of Test Results/Plots

Test Mode	Communication	AC120V 60Hz	Polarity:	Neutral
-----------	---------------	-------------	-----------	---------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1700	19.86	9.51	29.37	54.96	-25.59	AVG
2	0.1740	33.64	9.53	43.17	64.77	-21.60	QP
3*	0.6180	30.02	9.70	39.72	56.00	-16.28	QP
4	0.6180	19.60	9.70	29.30	46.00	-16.70	AVG
5	1.1740	27.03	9.69	36.72	56.00	-19.28	QP
6	1.2860	15.43	9.65	25.08	46.00	-20.92	AVG

Test Mode	Communication	AC120V 60Hz	Polarity:	Line
-----------	---------------	-------------	-----------	------



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1700	35.18	9.51	44.69	64.96	-20.27	QP
2	0.1740	23.46	9.53	32.99	54.77	-21.78	AVG
3	0.6140	22.77	9.70	32.47	46.00	-13.53	AVG
4*	0.6180	34.12	9.70	43.82	56.00	-12.18	QP
5	1.2740	30.93	9.65	40.58	56.00	-15.42	QP
6	1.2860	17.64	9.65	27.29	46.00	-18.71	AVG

APPENDIX SUMMARY

Project No.	WTX25X10271254W001	Test Engineer	BAldi Zhong
Start date	2025/10/31	Finish date	2025/11/02
Temperature	25℃	Humidity	56%
RF specifications	5G WIFI		

APPENDIX	Description of Test Item	Result
A1	Emission Bandwidth	Compliant
A2	Occupied channel bandwidth	Compliant
B	Duty Cycle	Compliant
C	Maximum conducted output power	Compliant
D	Maximum power spectral density	Compliant
E	Frequency Stability	Compliant

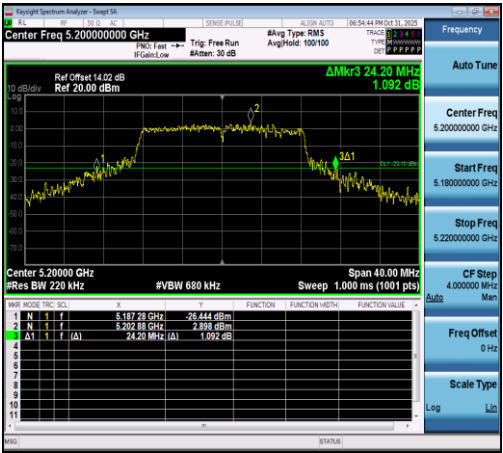
Appendix A1: Emission Bandwidth**Test Result**

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	25.480	5166.960	5192.440	---	---
11A	Ant1	5200	24.200	5187.280	5211.480	---	---
11A	Ant1	5240	24.760	5227.400	5252.160	---	---
11N20SISO	Ant1	5180	23.720	5168.000	5191.720	---	---
11N20SISO	Ant1	5200	23.800	5188.520	5212.320	---	---
11N20SISO	Ant1	5240	24.760	5227.560	5252.320	---	---
11N40SISO	Ant1	5190	44.800	5168.800	5213.600	---	---
11N40SISO	Ant1	5230	43.360	5208.560	5251.920	---	---
11AC20SISO	Ant1	5180	23.560	5167.880	5191.440	---	---
11AC20SISO	Ant1	5200	23.560	5188.800	5212.360	---	---
11AC20SISO	Ant1	5240	23.400	5228.680	5252.080	---	---
11AC40SISO	Ant1	5190	44.480	5167.360	5211.840	---	---
11AC40SISO	Ant1	5230	49.120	5208.720	5257.840	---	---
11AX20SISO	Ant1	5180	24.560	5168.440	5193.000	---	---
11AX20SISO	Ant1	5200	24.800	5189.560	5214.360	---	---
11AX20SISO	Ant1	5240	25.760	5227.920	5253.680	---	---
11AX40SISO	Ant1	5190	41.040	5169.200	5210.240	---	---
11AX40SISO	Ant1	5230	43.520	5208.960	5252.480	---	---

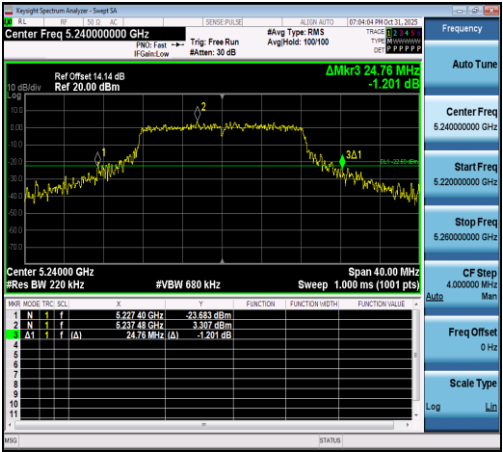
Test Graphs



11A-Ant1-5180



11A-Ant1-5200



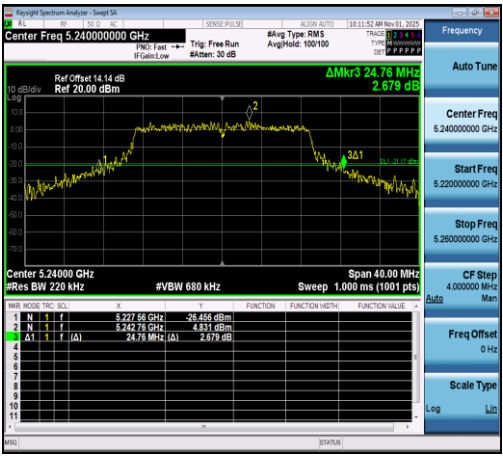
11A-Ant1-5240



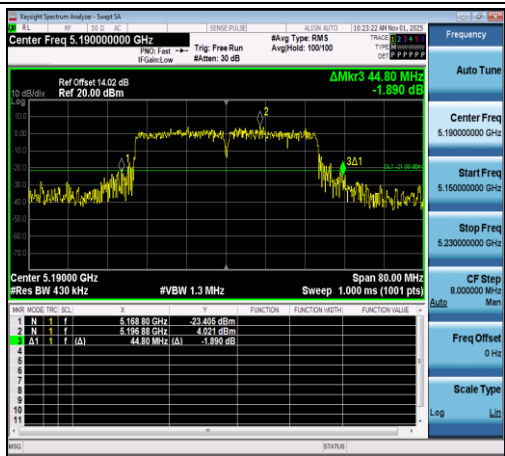
11N20SISO-Ant1-5180



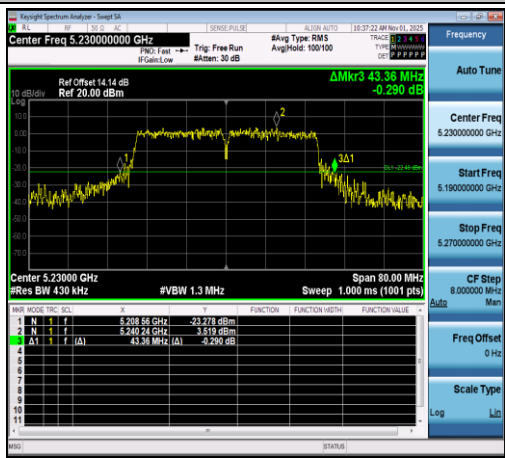
11N20SISO-Ant1-5200



11N20SISO-Ant1-5240



11N40SISO-Ant1-5190



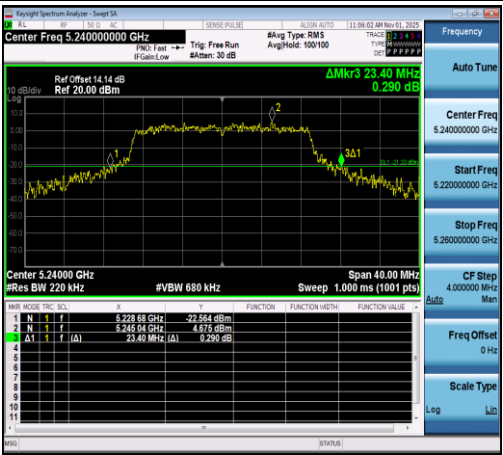
11N40SISO-Ant1-5230



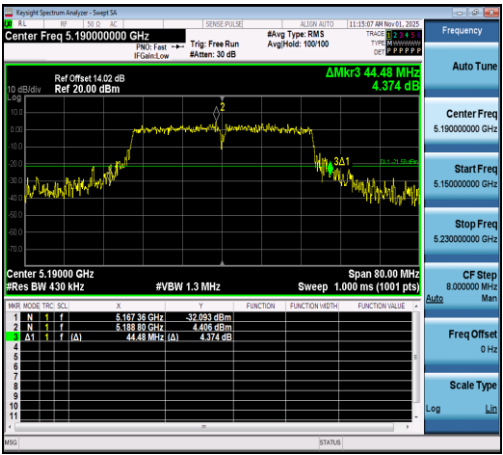
11AC20SISO-Ant1-5180



11AC20SISO-Ant1-5200



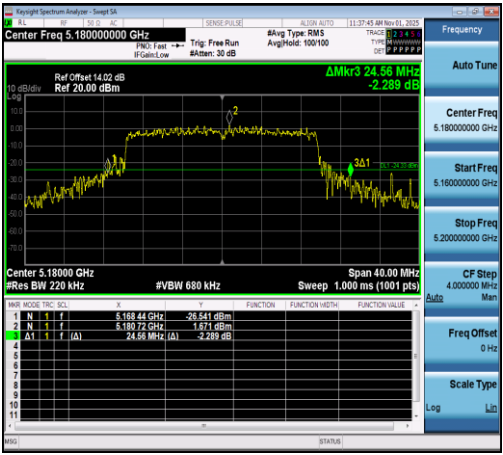
11AC20SISO-Ant1-5240



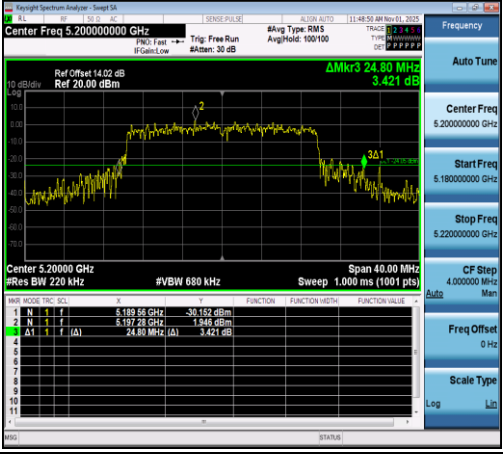
11AC40SISO-Ant1-5190



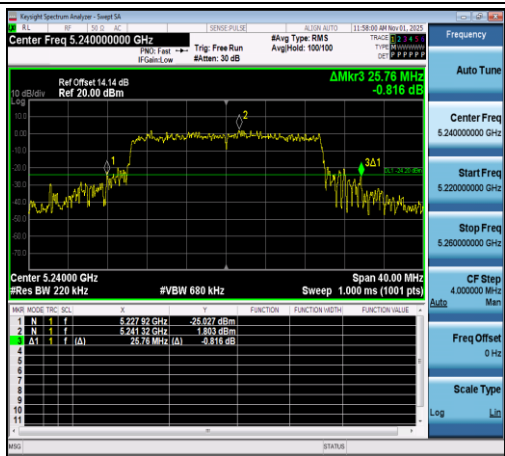
11AC40SISO-Ant1-5230



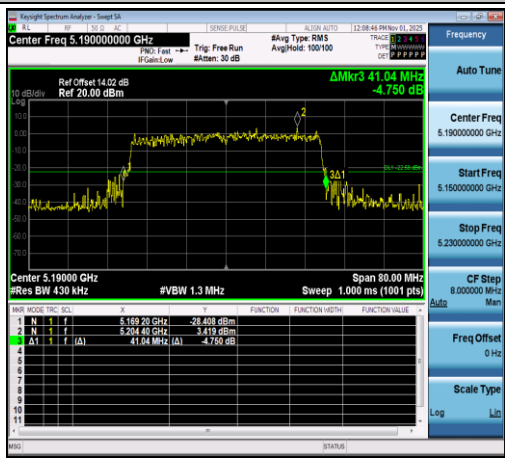
11AX20SISO-Ant1-5180



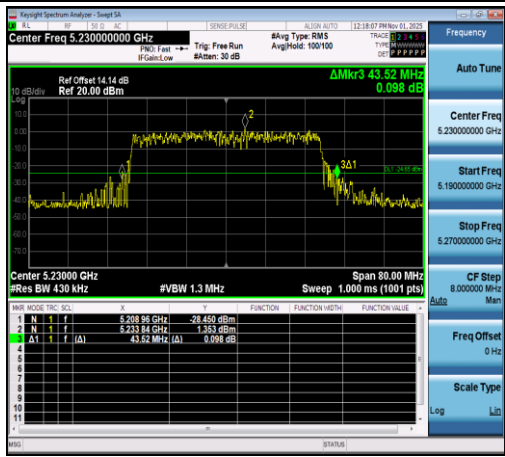
11AX20SISO-Ant1-5200



11AX20SISO-Ant1-5240



11AX40SISO-Ant1-5190

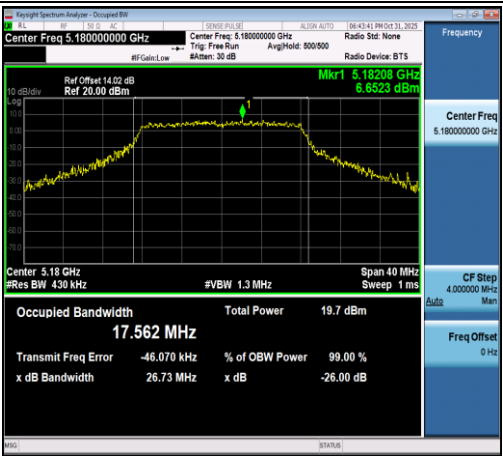


11AX40SISO-Ant1-5230

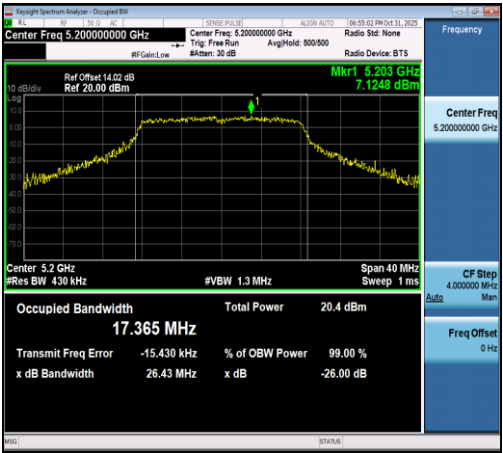
Appendix A2: Occupied channel bandwidth**Test Result**

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.562	5171.1729	5188.7349	---	---
11A	Ant1	5200	17.365	5191.3021	5208.6671	---	---
11A	Ant1	5240	17.340	5231.3525	5248.6925	---	---
11N20SISO	Ant1	5180	18.563	5170.7831	5189.3461	---	---
11N20SISO	Ant1	5200	18.454	5190.8074	5209.2614	---	---
11N20SISO	Ant1	5240	18.524	5230.7694	5249.2934	---	---
11N40SISO	Ant1	5190	36.820	5171.6793	5208.4993	---	---
11N40SISO	Ant1	5230	36.692	5211.7161	5248.4081	---	---
11AC20SISO	Ant1	5180	18.422	5170.8752	5189.2972	---	---
11AC20SISO	Ant1	5200	18.396	5190.7884	5209.1844	---	---
11AC20SISO	Ant1	5240	18.407	5230.8343	5249.2413	---	---
11AC40SISO	Ant1	5190	37.012	5171.6078	5208.6198	---	---
11AC40SISO	Ant1	5230	36.825	5211.6353	5248.4603	---	---
11AX20SISO	Ant1	5180	19.333	5170.3878	5189.7208	---	---
11AX20SISO	Ant1	5200	19.239	5190.4164	5209.6554	---	---
11AX20SISO	Ant1	5240	19.213	5230.4432	5249.6562	---	---
11AX40SISO	Ant1	5190	37.910	5171.1029	5209.0129	---	---
11AX40SISO	Ant1	5230	38.016	5211.0876	5249.1036	---	---

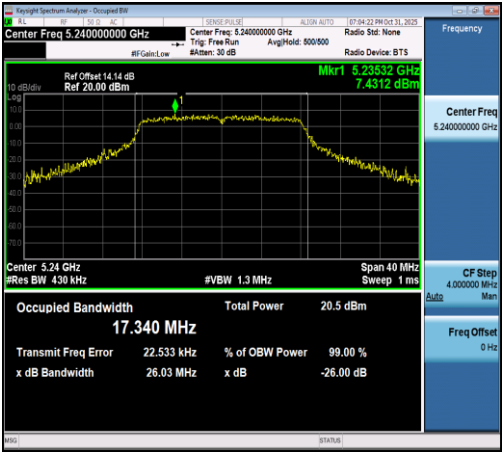
Test Graphs



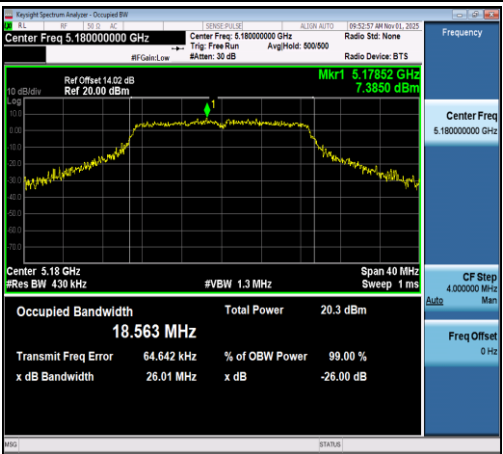
11A-Ant1-5180



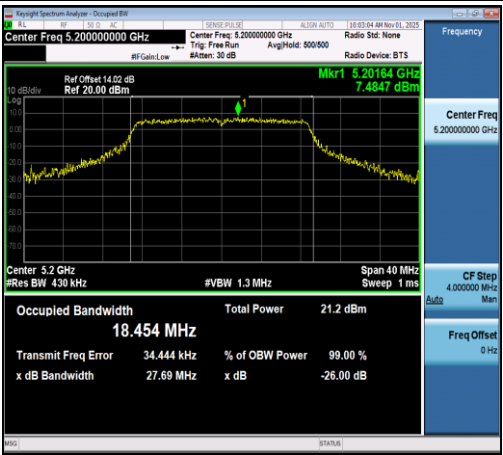
11A-Ant1-5200



11A-Ant1-5240



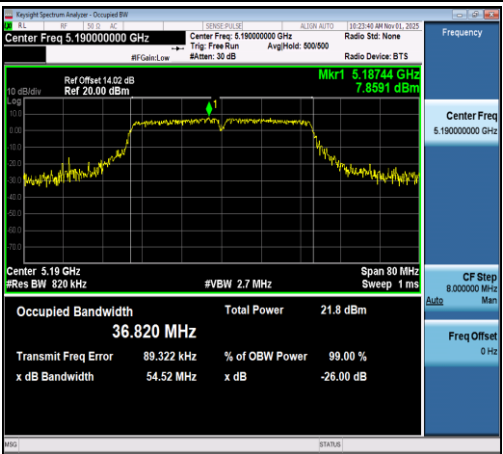
11N20SISO-Ant1-5180



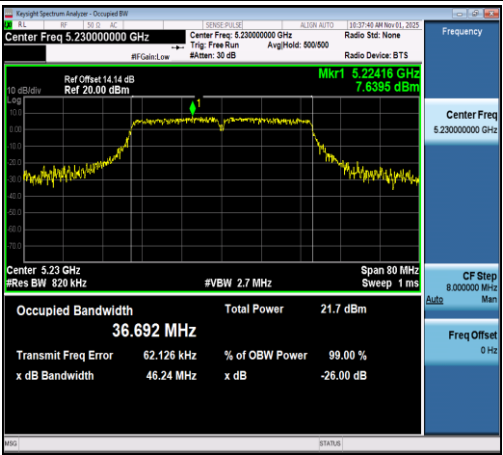
11N20SISO-Ant1-5200



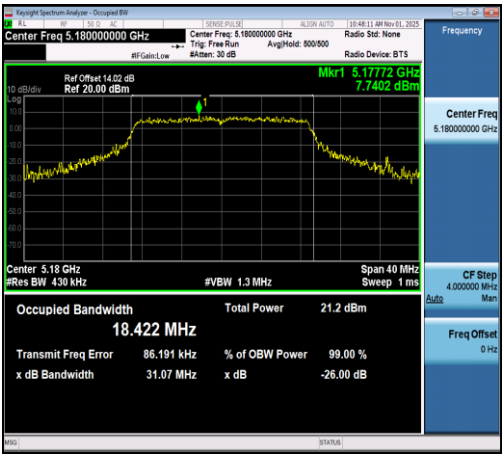
11N20SISO-Ant1-5240



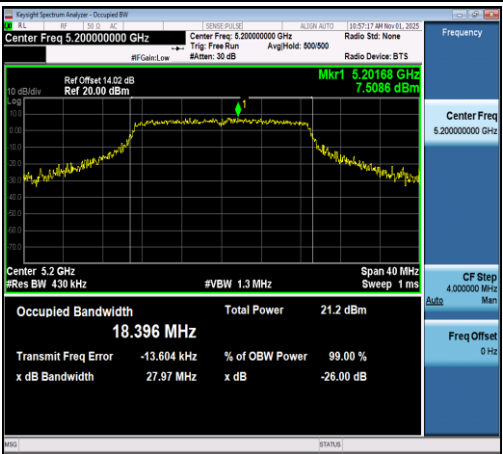
11N40SISO-Ant1-5190



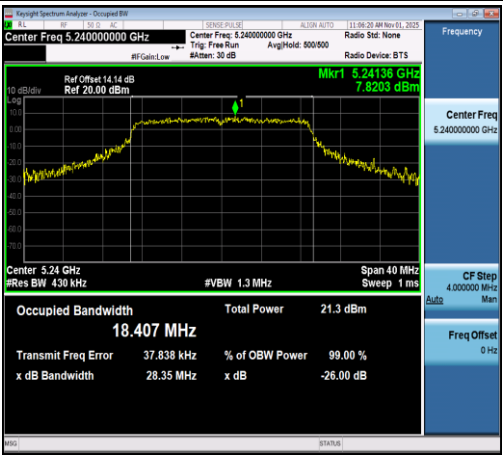
11N40SISO-Ant1-5230



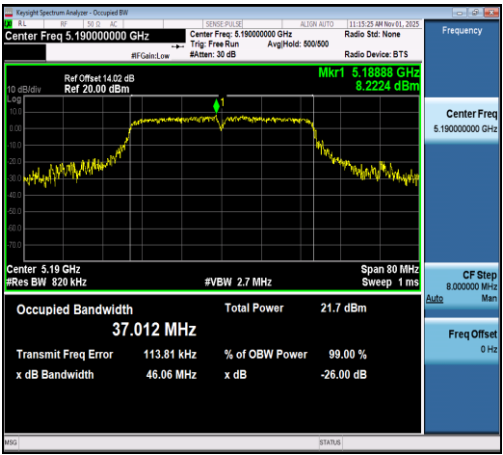
11AC20SISO-Ant1-5180



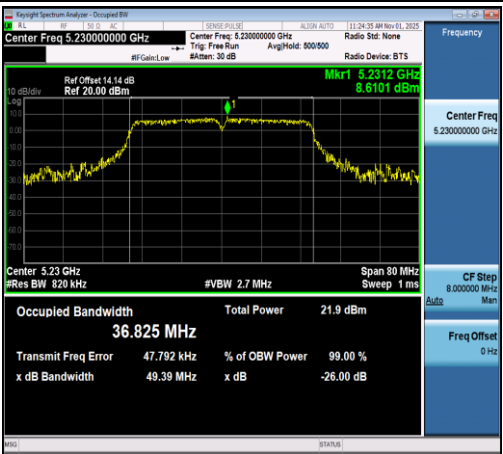
11AC20SISO-Ant1-5200



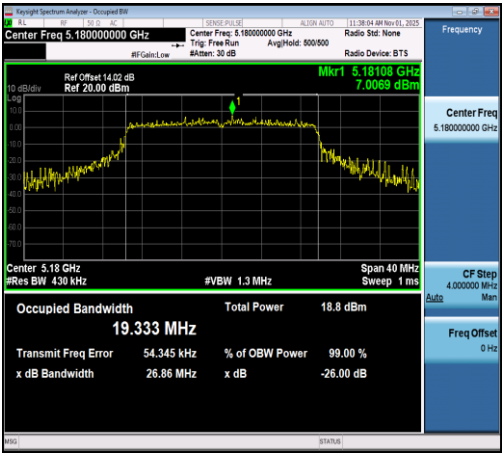
11AC20SISO-Ant1-5240



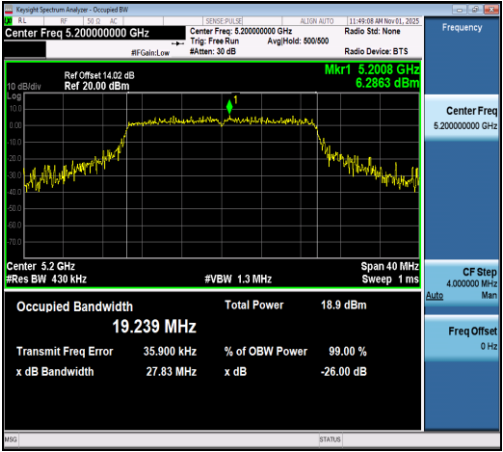
11AC40SISO-Ant1-5190



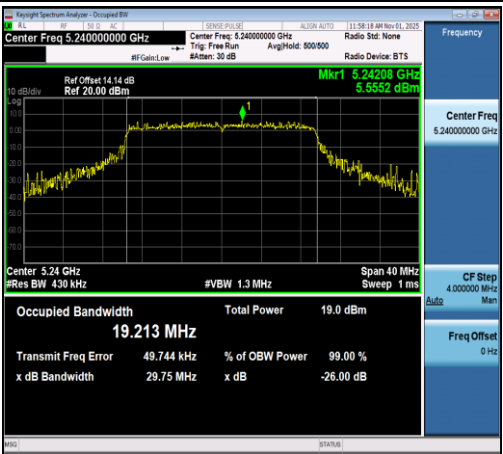
11AC40SISO-Ant1-5230



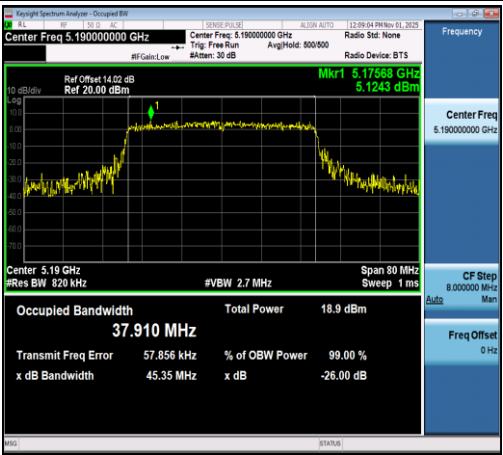
11AX20SISO-Ant1-5180



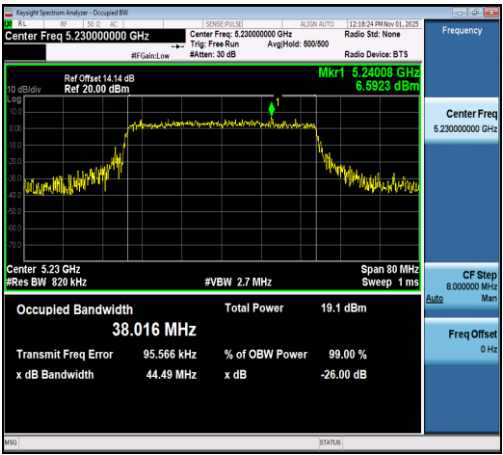
11AX20SISO-Ant1-5200



11AX20SISO-Ant1-5240



11AX40SISO-Ant1-5190

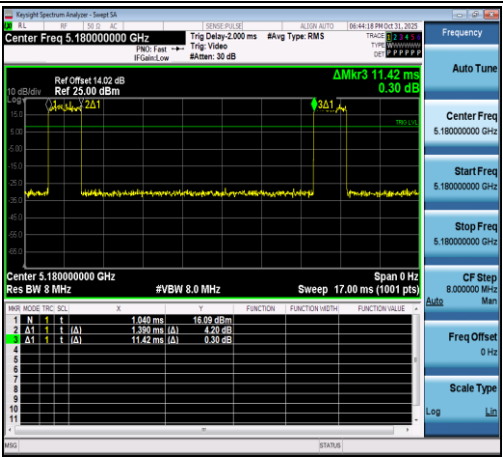


11AX40SISO-Ant1-5230

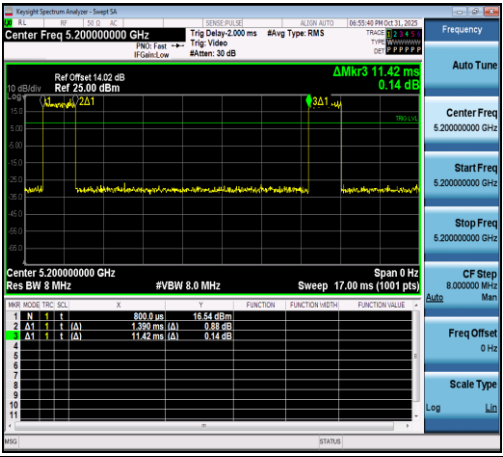
Appendix B: Duty Cycle**Test Result**

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Dc Factor [%]	1/T
11A	Ant1	5180	1.39	11.42	12.17	9.15	0.72
11A	Ant1	5200	1.39	11.42	12.17	9.15	0.72
11A	Ant1	5240	1.40	11.41	12.27	9.11	0.71
11N20SISO	Ant1	5180	1.27	11.30	11.24	9.49	0.79
11N20SISO	Ant1	5200	1.28	11.31	11.32	9.46	0.78
11N20SISO	Ant1	5240	1.27	11.28	11.26	9.48	0.79
11N40SISO	Ant1	5190	0.65	10.66	6.10	12.15	1.54
11N40SISO	Ant1	5230	0.63	10.66	5.91	12.28	1.59
11AC20SISO	Ant1	5180	1.29	11.32	11.40	9.43	0.78
11AC20SISO	Ant1	5200	1.29	11.30	11.42	9.42	0.78
11AC20SISO	Ant1	5240	1.28	11.31	11.32	9.46	0.78
11AC40SISO	Ant1	5190	0.65	10.66	6.10	12.15	1.54
11AC40SISO	Ant1	5230	0.63	10.66	5.91	12.28	1.59
11AX20SISO	Ant1	5180	1.00	11.01	9.08	10.42	1.00
11AX20SISO	Ant1	5200	0.98	11.01	8.90	10.51	1.02
11AX20SISO	Ant1	5240	0.98	11.01	8.90	10.51	1.02
11AX40SISO	Ant1	5190	0.53	10.56	5.02	12.99	1.89
11AX40SISO	Ant1	5230	0.54	10.56	5.11	12.92	1.85

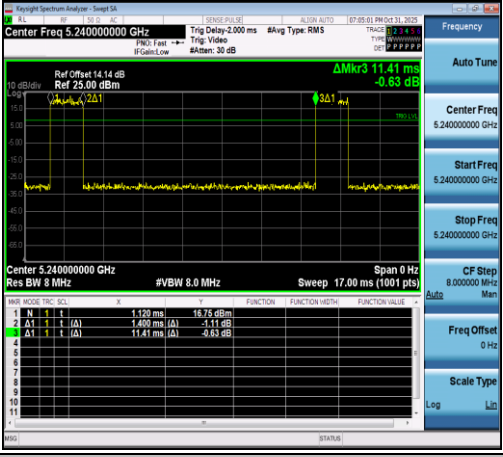
Test Graphs



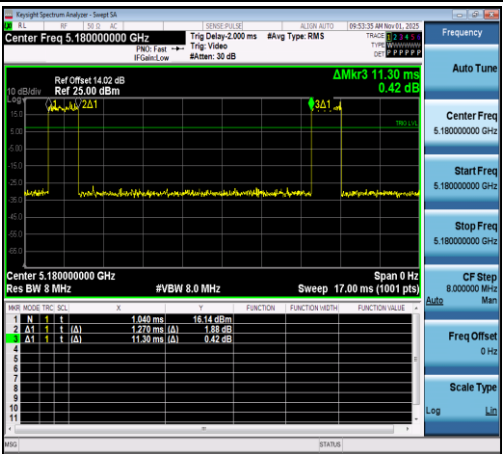
NTNV-11A-Ant1-5180



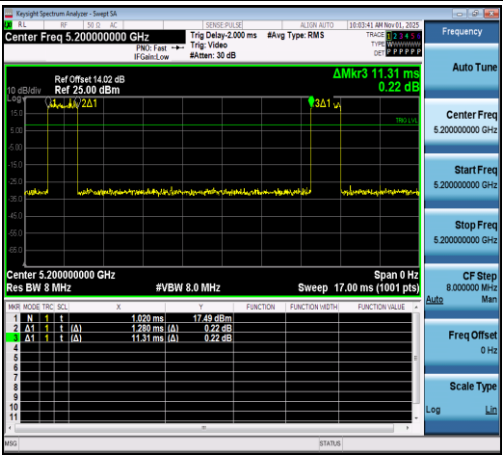
NTNV-11A-Ant1-5200



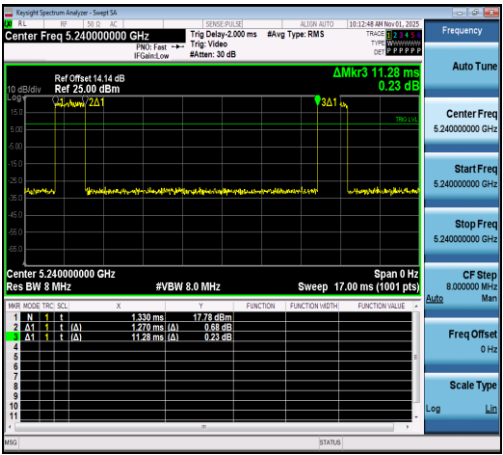
NTNV-11A-Ant1-5240



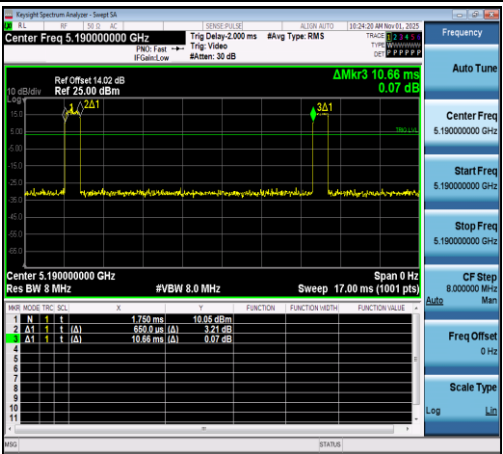
NTNV-11N20SISO-Ant1-5180



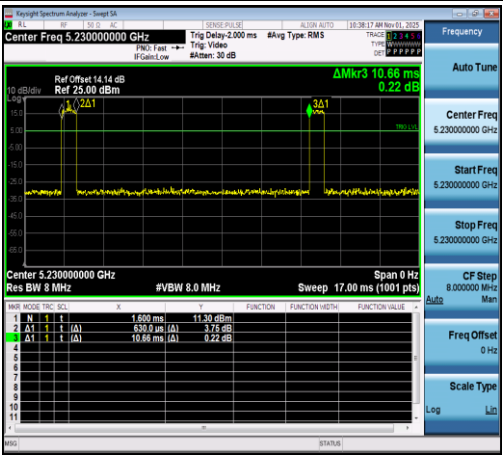
NTNV-11N20SISO-Ant1-5200



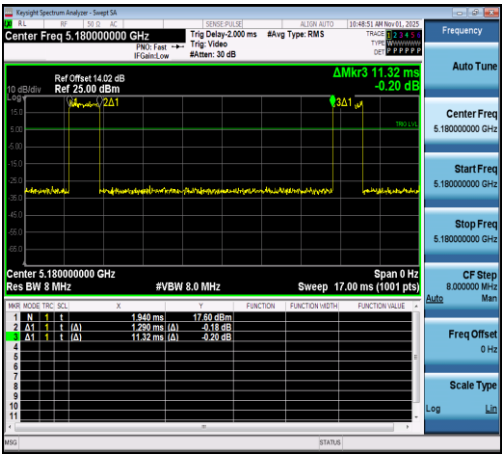
NTNV-11N20SISO-Ant1-5240



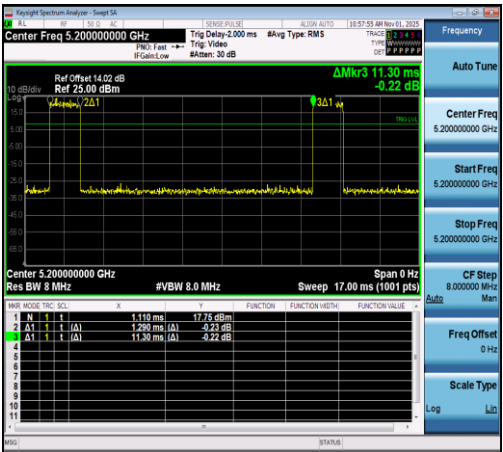
NTNV-11N40SISO-Ant1-5190



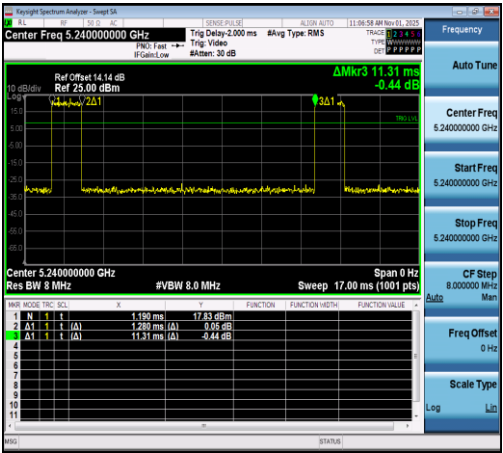
NTNV-11N40SISO-Ant1-5230



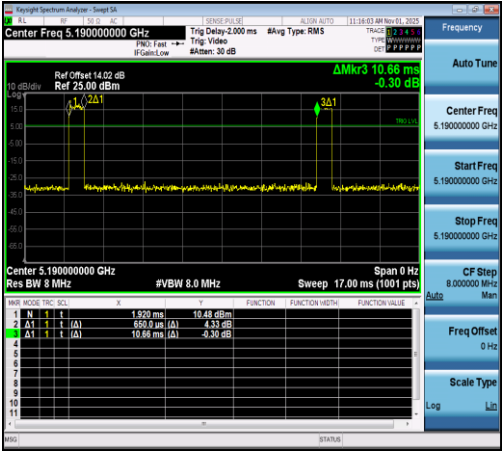
NTNV-11AC20SISO-Ant1-5180



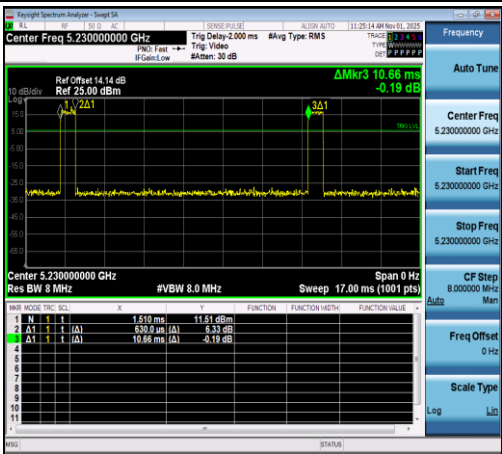
NTNV-11AC20SISO-Ant1-5200



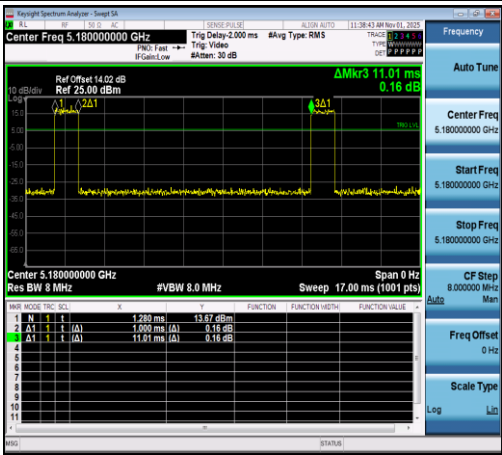
NTNV-11AC20SISO-Ant1-5240



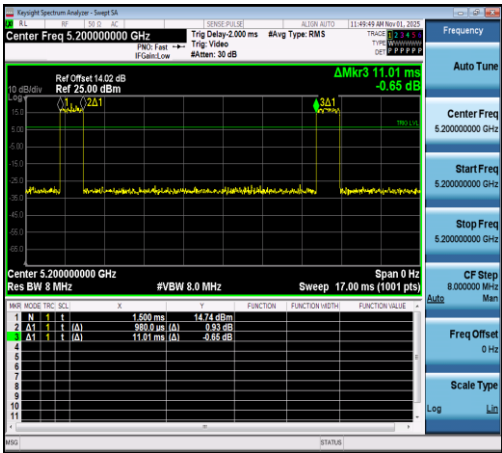
NTNV-11AC40SISO-Ant1-5190



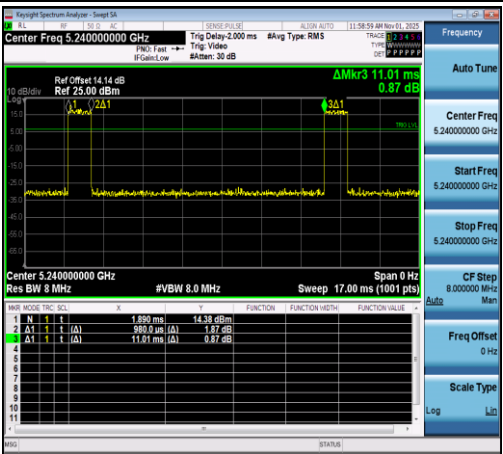
NTNV-11AC40SISO-Ant1-5230



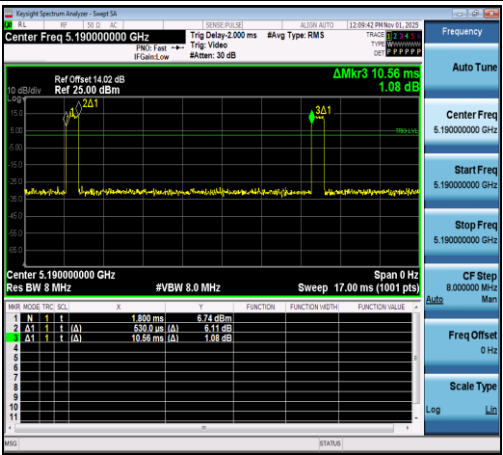
NTNV-11AX20SISO-Ant1-5180



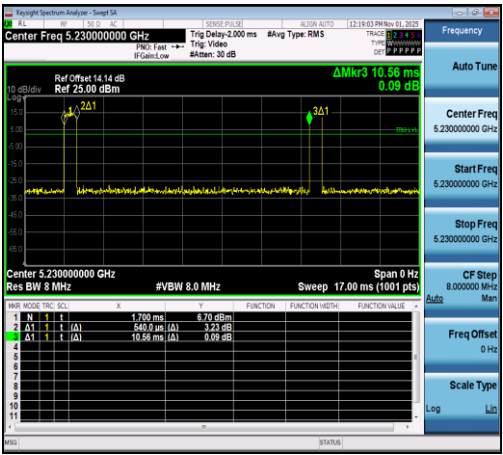
NTNV-11AX20SISO-Ant1-5200



NTNV-11AX20SISO-Ant1-5240



NTNV-11AX40SISO-Ant1-5190



NTNV-11AX40SISO-Ant1-5230

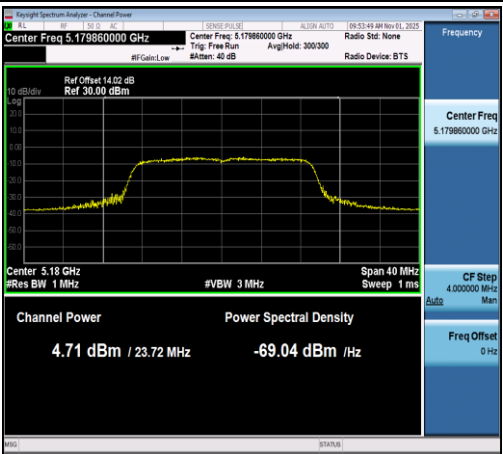
Appendix C: Maximum conducted output power**Test Result Channel Power**

Test Mode	Antenna	Frequency [MHz]	DC Factor [dBm]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	9.15	13.97	≤23.98	PASS
11A	Ant1	5200	9.15	14.86	≤23.98	PASS
11A	Ant1	5240	9.11	15.13	≤23.98	PASS
11N20SISO	Ant1	5180	9.49	14.20	≤23.98	PASS
11N20SISO	Ant1	5200	9.46	15.77	≤23.98	PASS
11N20SISO	Ant1	5240	9.48	15.27	≤23.98	PASS
11N40SISO	Ant1	5190	12.15	15.42	≤23.98	PASS
11N40SISO	Ant1	5230	12.28	14.63	≤23.98	PASS
11AC20SISO	Ant1	5180	9.43	15.34	≤23.98	PASS
11AC20SISO	Ant1	5200	9.42	15.72	≤23.98	PASS
11AC20SISO	Ant1	5240	9.46	15.52	≤23.98	PASS
11AC40SISO	Ant1	5190	12.15	15.53	≤23.98	PASS
11AC40SISO	Ant1	5230	12.28	15.31	≤23.98	PASS
11AX20SISO	Ant1	5180	10.42	12.36	≤23.98	PASS
11AX20SISO	Ant1	5200	10.51	12.29	≤23.98	PASS
11AX20SISO	Ant1	5240	10.51	12.12	≤23.98	PASS
11AX40SISO	Ant1	5190	12.99	11.29	≤23.98	PASS
11AX40SISO	Ant1	5230	12.92	11.90	≤23.98	PASS

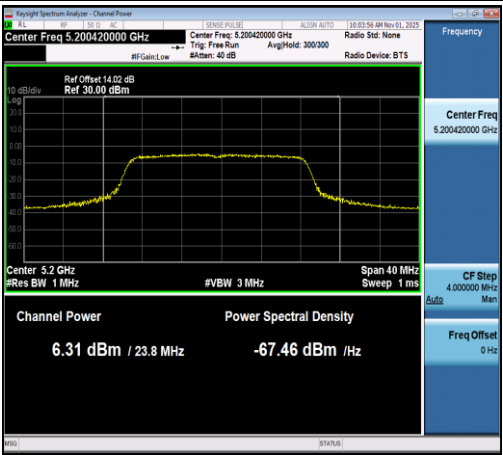
Note: The Duty Cycle Factor is compensated in the graph.

Test Graphs Channel Power

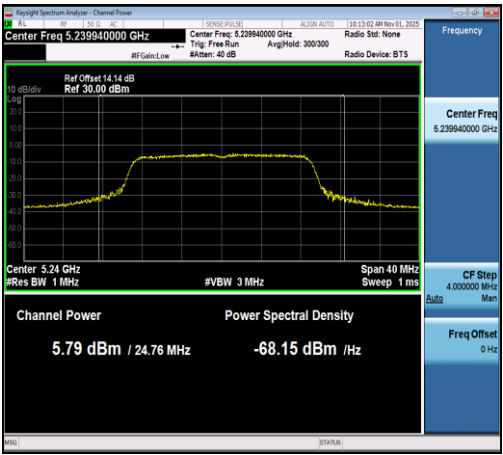




11N20SISO-Ant1-5180-PASS



11N20SISO-Ant1-5200-PASS



11N20SISO-Ant1-5240-PASS