

ATC

TESTREPORT

Applicant Name : KRIPTO MOBILE CORPORATION
Address : 7640 NW 25TH ST STE 101 MIAMI Florida United States 33122
Report Number: RA230413-19132E-RF-00D
FCC ID: 2APX7K69

Test Standard (s)

FCC PART 15.407

Sample Description

Product Type: 4G Smart Phone
Model No.: K69
Multiple Model(s) No.: N/A
Trade Mark: KRIP
Date Received: 2023/04/13
Report Date: 2023/05/24

Test Result:	Pass*
--------------	-------

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

Prepared and Checked By:

Andy Yu
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “*”.

Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk “**”. Customer model name, addresses, names, trademarks etc. are not considered data.

This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

Shenzhen Accurate Technology Co., Ltd.

1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China
Tel: +86 755-26503290 Fax: +86-755-26503290 Web: www.atc-lab.com

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY	4
GENERAL INFORMATION.....	5
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
OBJECTIVE	5
TEST METHODOLOGY	5
MEASUREMENT UNCERTAINTY	6
TEST FACILITY	6
SYSTEM TEST CONFIGURATION.....	7
DESCRIPTION OF TEST CONFIGURATION	7
EUT EXERCISE SOFTWARE	7
DUTY CYCLE	7
EQUIPMENT MODIFICATIONS	7
SUMMARY OF TEST RESULTS	10
TEST EQUIPMENT LIST	11
FCC §1.1307(B) & §2.1093 - RF EXPOSURE INFORMATION.....	13
APPLICABLE STANDARD	13
TEST RESULT	13
FCC §15.203 – ANTENNA REQUIREMENT.....	14
APPLICABLE STANDARD	14
ANTENNA CONNECTOR CONSTRUCTION	14
FCC §15.407 (B) (6) §15.207 (A) – CONDUCTED EMISSIONS.....	15
APPLICABLE STANDARD	15
EUT SETUP	15
EMI TEST RECEIVER SETUP.....	15
TEST PROCEDURE	15
FACTOR & MARGIN CALCULATION	16
TEST DATA	16
§15.205 & §15.209 & §15.407(B)– UNDESIRABLE EMISSION.....	19
APPLICABLE STANDARD	19
EUT SETUP	19
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	20
TEST PROCEDURE	20
FACTOR & MARGIN CALCULATION	21
TEST DATA	21
FCC §15.407(A),(E) – 26 DB & 6DB EMISSION BANDWIDTH.....	30
APPLICABLE STANDARD	30
TEST PROCEDURE	30
TEST DATA	31
FCC §15.407(A) – CONDUCTED TRANSMITTER OUTPUT POWER.....	32
APPLICABLE STANDARD	32
TEST PROCEDURE	32
TEST DATA	33

FCC §15.407(A) - POWER SPECTRAL DENSITY	34
TEST PROCEDURE	34
TEST DATA	35
APPENDIX	36
APPENDIX A1: EMISSION BANDWIDTH	36
APPENDIX A2: OCCUPIED CHANNEL BANDWIDTH	42
APPENDIX B: DUTY CYCLE	47
APPENDIX C: MAXIMUM CONDUCTED OUTPUT POWER	52
APPENDIX D: MAXIMUM POWER SPECTRAL DENSITY	53

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230413-19132E-RF-00D	Original Report	2023-05-24

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	5G Wi-Fi: 5150-5250MHz
Mode	802.11a/n20/n40/ac20/ac40/ac80
Maximum Conducted Average Output Power	9.31dBm
Modulation Technique	OFDM
Antenna Specification*	-3.1dBi (It is provided by the applicant)
Voltage Range	DC 3.87from battery or DC 5V from adapter
Sample serial number	RE&CE: 24LB_1 RF: 24LB_4 (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter information	Model: C69 Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. And KDB789033 D02 General U-NII Test Procedures New Rules v02r01.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter	Uncertainty	
Occupied Channel Bandwidth	5%	
RF Frequency	0.082×10^{-7}	
RF output power, conducted	0.71dB	
Unwanted Emission, conducted	1.6dB	
AC Power Lines Conducted Emissions	2.72dB	
Audio Frequency Response	0.1dB	
Low Pass Filter Response	1.2dB	
Modulation Limiting	1%	
Emissions, Radiated	9kHz - 30MHz	2.06dB
	30MHz - 1GHz	5.08dB
	1GHz - 18GHz	4.96dB
	18GHz - 26.5GHz	5.16dB
	26.5GHz - 40GHz	4.64dB
Temperature	1°C	
Humidity	6%	
Supply voltages	0.4%	

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

Accredited by American Association for Laboratory Accreditation (A2LA). The Certificate Number is 4297.01

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 30241.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode, which was provided by manufacturer.

The device support 802.11a/n20/n40/ac20/ac40/ac80 mode, the 802.11n20/n40 mode were reduce test as it identical to 802.11a20/ac40 mode.

For 5150-5250MHz Band, 7 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240
42	5210	/	/

For 802.11a/ac20 mode: channel 36, 40, 48 were tested;

For 802.11ac40 mode: channel 38, 46 were tested;

For 802.11ac80 mode, channel 42 was tested.

EUT Exercise Software

EUT was test in engineering mode. The worst case was performed under and the power level was provided by the applicant.

U-NII	Mode	Data rate	Power Level		
			Low Channel	Middle Channel	High Channel
5150-5250MHz	802.11a	6Mbps	24	24	24
	802.11ac20	MCS0	24	24	24
	802.11ac40	MCS0	16	/	16
	802.11ac80	MCS0	/	14	/

The worse-case data rates are determined to be as follows for each mode based upon investigations by measuring the output power and PSD across all data rated bandwidths, and modulations.

Duty cycle

Test Result: Pass. Please refer to the Appendix.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

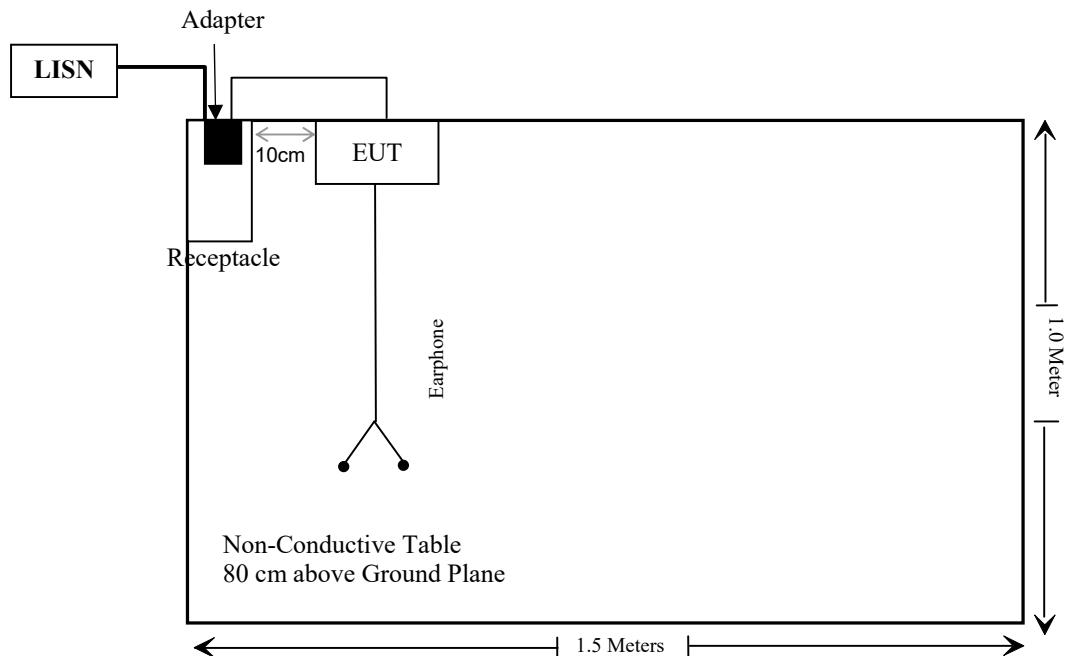
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

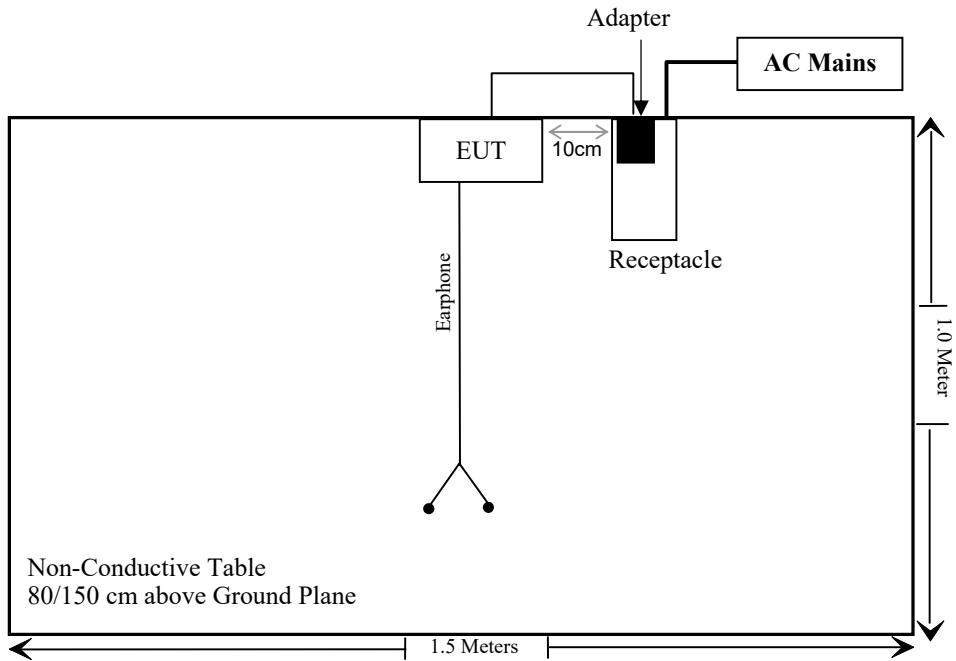
Cable Description	Length (m)	From/Port	To
Un-shielding Un-Detachable AC Cable	1.0	LISN	Receptacle
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For conducted emissions:



For Radiated Emissions:



Note: the support table edge was flush with center of turntable

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 ,§2.1093	RF Exposure (SAR)	Compliant
§15.203	Antenna Requirement	Compliant
§15.407(b)(9)& §15.207(a)	Conducted Emissions	Compliant
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliant
§15.407(a)	Conducted Transmitter Output Power	Compliant
§15.407 (a)	Power Spectral Density	Compliant
§15.407 (h)	Transmit Power Control (TPC)	Not Applicable
§15.407 (h)	Dynamic Frequency Selection (DFS)	Not Applicable

Not Applicable: the EUT not operating within frequency range of 5250-5350MHz&5470-5725MHz.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100784	2022/11/25	2023/11/24
Rohde & Schwarz	L.I.S.N.	ESH3-Z5	100305	2022/12/01	2023/11/30
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2022/12/07	2023/12/06
Unknown	RF Coaxial Cable	No.17	N0350	2022/11/25	2023/11/24
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde & Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde & Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2022/12/26	2025/12/25
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.15	N600	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.16	N650	2022/11/25	2023/11/24
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2022/11/25	2023/11/24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101590	2022/11/25	2023/11/24
Tonscend	RF Control Unit	JS0806-2	19G8060182	2022/10/24	2023/10/23
Agilent	Power Sensor	U2021XA	MY5425003	2023/02/25	2024/02/24
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.31	RF-01	Each time	

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: CR230419132-20.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.

b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has one internal antenna arrangement for 5G Wi-Fi which were permanently attached. Please refer to the EUT photos.

Type	Antenna Gain	Impedance	Frequency Range
FPC	-3.1dBi	50Ω	5150-5250MHz

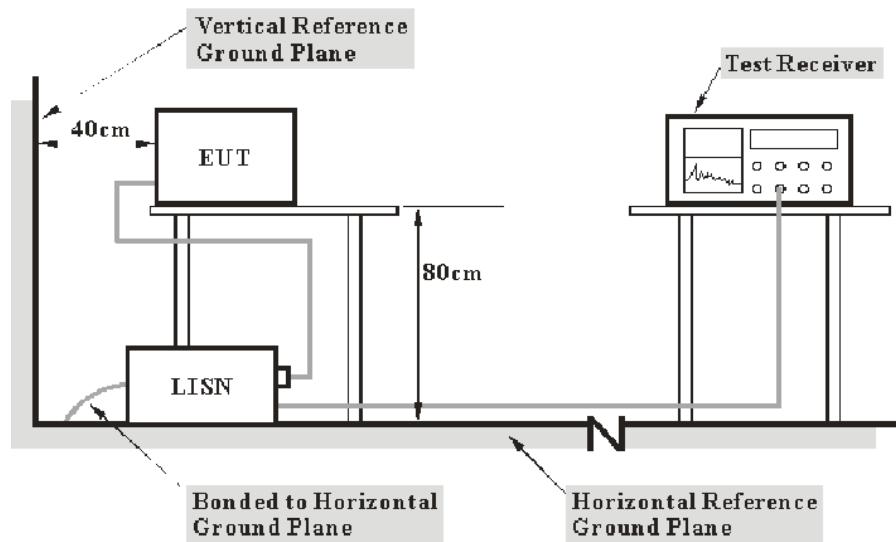
Result: Compliant.

FCC §15.407 (b) (6) §15.207 (a) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §15.407(b) (6)

EUT Setup



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

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

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and Average detection mode.

Factor & Margin Calculation

The factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss}$$

The “**Over limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

$$\text{Over Limit} = \text{Level} - \text{Limit}$$

$$\text{Level} = \text{Read Level} + \text{Factor}$$

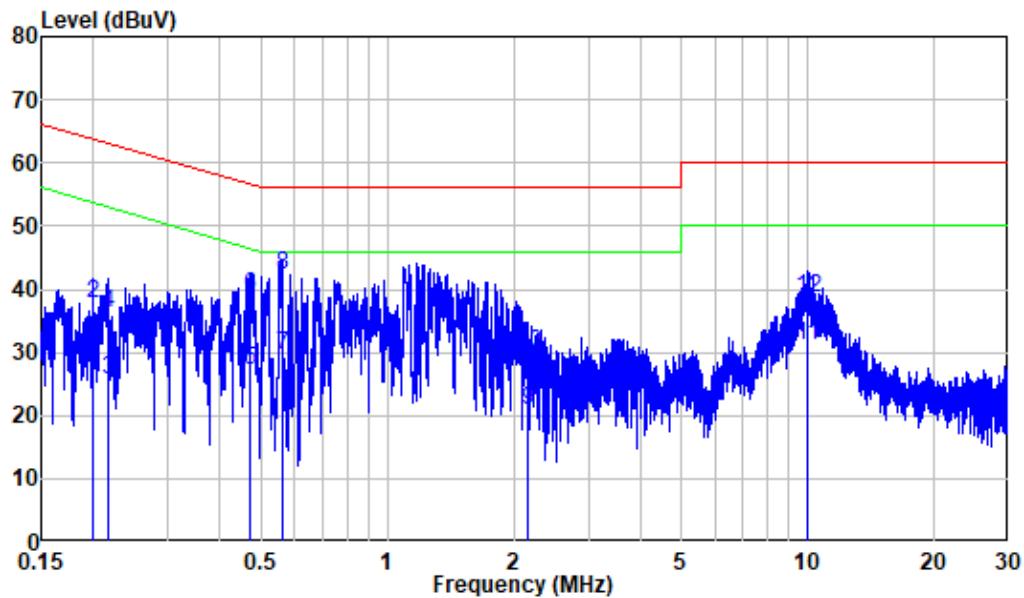
Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

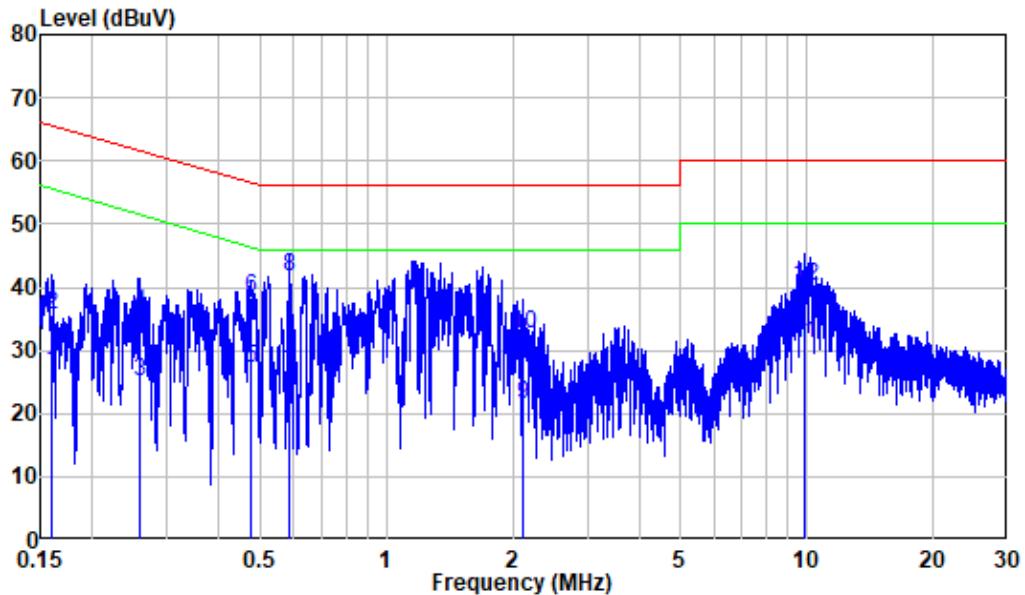
The testing was performed by Jerry Wu on 2023-05-11.

EUT operation mode: Transmitting (worst case is 802.11a, 5180MHz)

AC 120V/60 Hz, Line:

Site : Shielding Room
Condition: Line
Job No. : RA230413-19132E-RF
Mode : Charging+5G WIFI Transmitting
Power : AC 120V 60Hz

Freq	Factor	Read		Limit		Over	Remark
		MHz	dB	dBuV	dBuV		
1	0.200	10.29	17.41	27.70	53.61	-25.91	Average
2	0.200	10.29	27.44	37.73	63.61	-25.88	QP
3	0.216	10.31	15.39	25.70	52.97	-27.27	Average
4	0.216	10.31	25.80	36.11	62.97	-26.86	QP
5	0.469	10.55	16.52	27.07	46.53	-19.46	Average
6	0.469	10.55	28.35	38.90	56.53	-17.63	QP
7	0.561	10.60	18.92	29.52	46.00	-16.48	Average
8	0.561	10.60	31.54	42.14	56.00	-13.86	QP
9	2.158	10.41	10.44	20.85	46.00	-25.15	Average
10	2.158	10.41	19.35	29.76	56.00	-26.24	QP
11	9.979	10.62	20.60	31.22	50.00	-18.78	Average
12	9.979	10.62	27.91	38.53	60.00	-21.47	QP

AC 120V/60 Hz, Neutral:

Site : Shielding Room
Condition: Neutral
Job No. : RA230413-19132E-RF
Mode : Charging+5G WIFI Transmitting
Power : AC 120V 60Hz

Freq	Factor	Read		Limit	Over	Remark
		MHz	dB	dBuV	dBuV	
1	0.160	10.28	16.16	26.44	55.45	-29.01 Average
2	0.160	10.28	25.22	35.50	65.45	-29.95 QP
3	0.258	10.33	14.77	25.10	51.51	-26.41 Average
4	0.258	10.33	25.66	35.99	61.51	-25.52 QP
5	0.475	10.45	16.73	27.18	46.42	-19.24 Average
6	0.475	10.45	27.86	38.31	56.42	-18.11 QP
7	0.588	10.47	15.86	26.33	46.00	-19.67 Average
8	0.588	10.47	31.29	41.76	56.00	-14.24 QP
9	2.109	10.50	11.00	21.50	46.00	-24.50 Average
10	2.109	10.50	22.04	32.54	56.00	-23.46 QP
11	9.828	10.71	20.42	31.13	50.00	-18.87 Average
12	9.828	10.71	29.58	40.29	60.00	-19.71 QP

§15.205 & §15.209 & §15.407(B) – UNDESIRABLE EMISSION

Applicable Standard

FCC §15.407 (b); §15.209; §15.205;

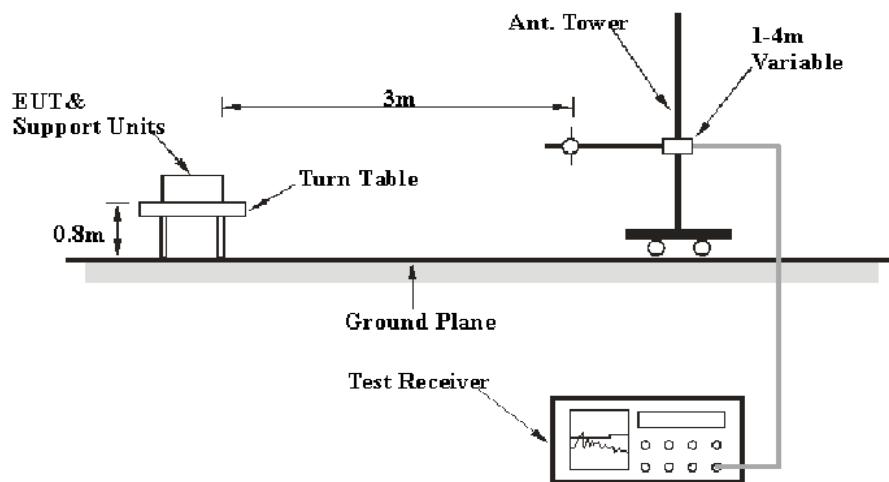
(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

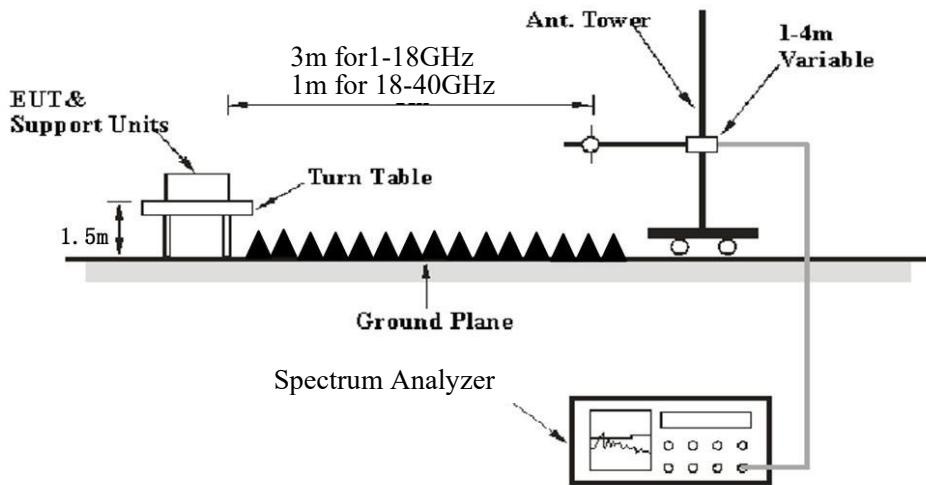
- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.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

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

EUT Setup

Below 1 GHz:



Above 1 GHz:

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC 15.209 and FCC 15.407 limits.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1MHz	10 Hz ^{Note 1}	/	Average
	1MHz	>1/T ^{Note 2}	/	Average

Note 1: when duty cycle is no less than 98%

Note 2: when duty cycle is less than 98%

Test Procedure**Radiated Spurious Emission**

During the radiated emission test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all the installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to ANSI C63.10-2013,9.4: For field strength measurements made at other than the distance at which the applicable limit is specified, extrapolate the measured field strength to the field strength at the distance specified by the limit using an inverse distance correction factor (20 dB/decade of distance). In some cases, a different distance correction factor may be required;

$$E_{\text{SpecLimit}} = E_{\text{Meas}} + 20 \log \left(\frac{d_{\text{Meas}}}{d_{\text{SpecLimit}}} \right)$$

where

$E_{\text{SpecLimit}}$ is the field strength of the emission at the distance specified by the limit, in dB μ V/m
 E_{Meas} is the field strength of the emission at the measurement distance, in dB μ V/m
 d_{Meas} is the measurement distance, in m
 $d_{\text{SpecLimit}}$ is the distance specified by the limit, in m

So the extrapolation factor of 1m is $20 \log(1/3) = -9.5$ dB, for 18-40GHz range, the limit of 1m distance was added by 9.5dB from limit of 3m to compared with the result measurement at 1m distance.

Factor & Margin Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Over Limit/Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

$$\begin{aligned} \text{Over Limit/Margin} &= \text{Level} / \text{Corrected Amplitude} - \text{Limit} \\ \text{Level} / \text{Corrected Amplitude} &= \text{Read Level} + \text{Factor} \end{aligned}$$

Test Data

Environmental Conditions

Temperature:	24~25.3 °C
Relative Humidity:	56~57 %
ATM Pressure:	101.0 kPa

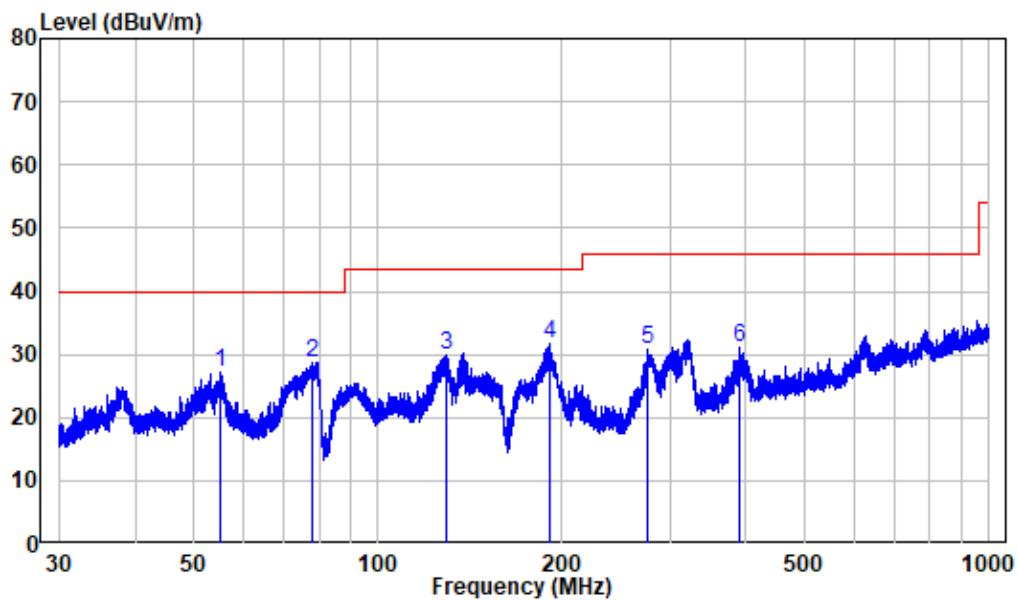
The testing was performed by Jimi Zheng on 2023-05-1 for below 1GHz and Zeki Ma on 2023-04-26 for above 1GHz.

EUT operation mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case of X-axes orientation were recorded)

30 MHz – 1 GHz: (worst case is 802.11a, 5180MHz)

Note: When the test result of Peak was more than 6dB below the limit of QP, just the Peak value was recorded.

Horizontal



Site : chamber

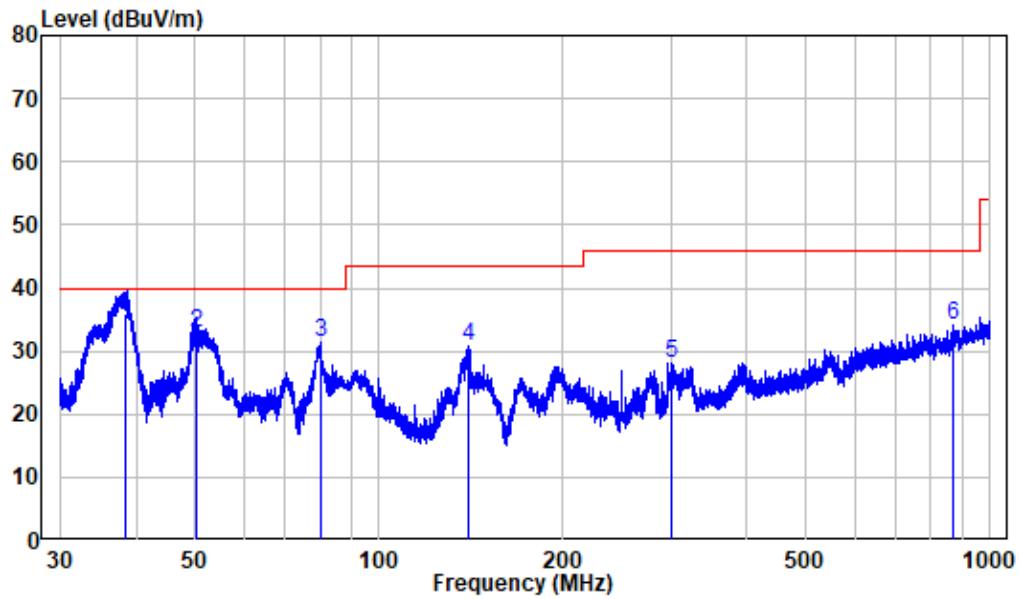
Condition: 3m HORIZONTAL

Job No. : RA230413-19132E-RF

Test Mode: Charging+5G WIFI Transmitting

	Freq	Read Factor	Level	Limit Level	Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	55.052	-10.28	37.30	27.02	40.00	-12.98	Peak
2	78.173	-16.62	45.38	28.76	40.00	-11.24	Peak
3	129.525	-14.85	44.74	29.89	43.50	-13.61	Peak
4	190.656	-11.47	43.10	31.63	43.50	-11.87	Peak
5	275.640	-9.86	40.65	30.79	46.00	-15.21	Peak
6	390.380	-6.88	38.10	31.22	46.00	-14.78	Peak

Vertical



Site : chamber

Condition: 3m VERTICAL

Job No. : RA230413-19132E-RF

Test Mode: Charging+5G WIFI Transmitting

	Freq	Factor	Read Level	Limit Level	Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	38.346	-10.74	46.70	35.96	40.00	-4.04	QP
2	50.210	-9.92	42.90	32.98	40.00	-7.02	QP
3	80.010	-16.79	48.23	31.44	40.00	-8.56	Peak
4	140.404	-15.47	46.16	30.69	43.50	-12.81	Peak
5	301.158	-9.19	37.12	27.93	46.00	-18.07	Peak
6	870.655	1.03	33.03	34.06	46.00	-11.94	Peak

Above 1GHz:**5150-5250 MHz:**

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)					
	Reading (dB μ V)	PK/Ave		Height (m)	Polar (H/V)									
802.11a														
5180 MHz														
4500	66.17	PK	127	1.1	H	-6.44	59.73	74	-14.27					
4500	53.95	AV	127	1.1	H	-6.44	47.51	54	-6.49					
4500	66.28	PK	349	1.5	V	-6.44	59.84	74	-14.16					
4500	54.06	AV	349	1.5	V	-6.44	47.62	54	-6.38					
5150	68.83	PK	164	1.4	H	-4.91	63.92	74	-10.08					
5150	55.41	AV	164	1.4	H	-4.91	50.50	54	-3.50					
5150	68.95	PK	351	1.7	V	-4.91	64.04	74	-9.96					
5150	55.52	AV	351	1.7	V	-4.91	50.61	54	-3.39					
10360	55.18	PK	337	1.5	H	5.36	60.54	68.2	-7.66					
10360	55.43	PK	328	1.5	V	5.36	60.79	68.2	-7.41					
5200 MHz														
10400	54.63	PK	288	1.7	H	5.66	60.29	68.2	-7.91					
10400	54.99	PK	115	1.7	V	5.66	60.65	68.2	-7.55					
5240 MHz														
5350	65.87	PK	143	2.2	H	-3.89	61.98	74	-12.02					
5350	50.99	AV	143	2.2	H	-3.89	47.10	54	-6.90					
5350	65.98	PK	341	1.7	V	-3.89	62.09	74	-11.91					
5350	51.11	AV	341	1.7	V	-3.89	47.22	54	-6.78					
5460	63.29	PK	359	1.6	H	-3.24	60.05	74	-13.95					
5460	49.34	AV	359	1.6	H	-3.24	46.10	54	-7.90					
5460	63.41	PK	56	2.3	V	-3.24	60.17	74	-13.83					
5460	49.45	AV	56	2.3	V	-3.24	46.21	54	-7.79					
10480	55.29	PK	337	1.5	H	5.52	60.81	68.2	-7.39					
10480	55.60	PK	16	1.5	V	5.52	61.12	68.2	-7.08					

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)					
	Reading (dB μ V)	PK/Ave		Height (m)	Polar (H/V)									
802.11ac20														
5180 MHz														
4500	66.42	PK	209	1.7	H	-6.44	59.98	74	-14.02					
4500	54.07	AV	209	1.7	H	-6.44	47.63	54	-6.37					
4500	66.53	PK	278	1.4	V	-6.44	60.09	74	-13.91					
4500	54.18	AV	278	1.4	V	-6.44	47.74	54	-6.26					
5150	69.11	PK	177	2.2	H	-4.91	64.20	74	-9.80					
5150	55.54	AV	177	2.2	H	-4.91	50.63	54	-3.37					
5150	69.23	PK	238	1.4	V	-4.91	64.32	74	-9.68					
5150	55.66	AV	238	1.4	V	-4.91	50.75	54	-3.25					
10360	55.33	PK	259	1.2	H	5.36	60.69	68.2	-7.51					
10360	55.67	PK	170	1.2	V	5.36	61.03	68.2	-7.17					
5200MHz														
10400	54.90	PK	305	1.8	H	5.66	60.56	68.2	-7.64					
10400	55.19	PK	264	1.8	V	5.66	60.85	68.2	-7.35					
5240 MHz														
5350	66.09	PK	349	2.2	H	-3.89	62.20	74	-11.80					
5350	51.15	AV	349	2.2	H	-3.89	47.26	54	-6.74					
5350	66.21	PK	87	1.4	V	-3.89	62.32	74	-11.68					
5350	51.27	AV	87	1.4	V	-3.89	47.38	54	-6.62					
5460	63.39	PK	145	1	H	-3.24	60.15	74	-13.85					
5460	49.45	AV	145	1	H	-3.24	46.21	54	-7.79					
5460	63.50	PK	68	1.3	V	-3.24	60.26	74	-13.74					
5460	49.57	AV	68	1.3	V	-3.24	46.33	54	-7.67					
10480	55.48	PK	223	1.2	H	5.52	61.00	68.2	-7.20					
10480	55.83	PK	349	1.2	V	5.52	61.35	68.2	-6.85					

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)					
	Reading (dB μ V)	PK/Ave		Height (m)	Polar (H/V)									
802.11ac40														
5190 MHz														
4500	66.26	PK	75	1.5	H	-6.44	59.82	74	-14.18					
4500	54.42	AV	75	1.5	H	-6.44	47.98	54	-6.02					
4500	66.37	PK	230	2	V	-6.44	59.93	74	-14.07					
4500	54.54	AV	230	2	V	-6.44	48.10	54	-5.90					
5150	70.02	PK	1	2.2	H	-4.91	65.11	74	-8.89					
5150	56.65	AV	1	2.2	H	-4.91	51.74	54	-2.26					
5150	70.20	PK	196	1.2	V	-4.91	65.29	74	-8.71					
5150	56.83	AV	196	1.2	V	-4.91	51.92	54	-2.08					
10380	55.24	PK	199	1.7	H	5.51	60.75	68.2	-7.45					
10380	55.47	PK	135	1.7	V	5.51	60.98	68.2	-7.22					
5230 MHz														
5350	66.15	PK	294	1.9	H	-3.89	62.26	74	-11.74					
5350	51.96	AV	294	1.9	H	-3.89	48.07	54	-5.93					
5350	66.27	PK	3	1.6	V	-3.89	62.38	74	-11.62					
5350	52.08	AV	3	1.6	V	-3.89	48.19	54	-5.81					
5460	63.58	PK	263	1.4	H	-3.24	60.34	74	-13.66					
5460	50.40	AV	263	1.4	H	-3.24	47.16	54	-6.84					
5460	63.69	PK	242	2.3	V	-3.24	60.45	74	-13.55					
5460	50.51	AV	242	2.3	V	-3.24	47.27	54	-6.73					
10460	55.58	PK	32	1.7	H	5.51	61.09	68.2	-7.11					
10460	55.79	PK	69	1.7	V	5.51	61.30	68.2	-6.90					

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)					
	Reading (dB μ V)	PK/Ave		Height (m)	Polar (H/V)									
802.11ac80														
5210MHz														
4500	66.56	PK	250	1.5	H	-6.44	60.12	74	-13.88					
4500	55.61	AV	250	1.5	H	-6.44	49.17	54	-4.83					
4500	66.67	PK	217	2	V	-6.44	60.23	74	-13.77					
4500	55.72	AV	217	2	V	-6.44	49.28	54	-4.72					
5150	69.32	PK	14	2.2	H	-4.91	64.41	74	-9.59					
5150	56.80	AV	14	2.2	H	-4.91	51.89	54	-2.11					
5150	69.47	PK	281	1.7	V	-4.91	64.56	74	-9.44					
5150	56.93	AV	281	1.7	V	-4.91	52.02	54	-1.98					
5350	66.60	PK	317	2.4	H	-3.89	62.71	74	-11.29					
5350	52.97	AV	317	2.4	H	-3.89	49.08	54	-4.92					
5350	66.71	PK	196	2	V	-3.89	62.82	74	-11.18					
5350	53.08	AV	196	2	V	-3.89	49.19	54	-4.81					
5460	63.58	PK	348	1.5	H	-3.24	60.34	74	-13.66					
5460	51.43	AV	348	1.5	H	-3.24	48.19	54	-5.81					
5460	63.71	PK	135	1.3	V	-3.24	60.47	74	-13.53					
5460	51.54	AV	135	1.3	V	-3.24	48.30	54	-5.70					
10420	55.31	PK	260	2.4	H	5.60	60.91	68.2	-7.29					
10420	55.52	PK	25	2.4	V	5.60	61.12	68.2	-7.08					

Note:

Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Corrected Amplitude = Factor + Reading

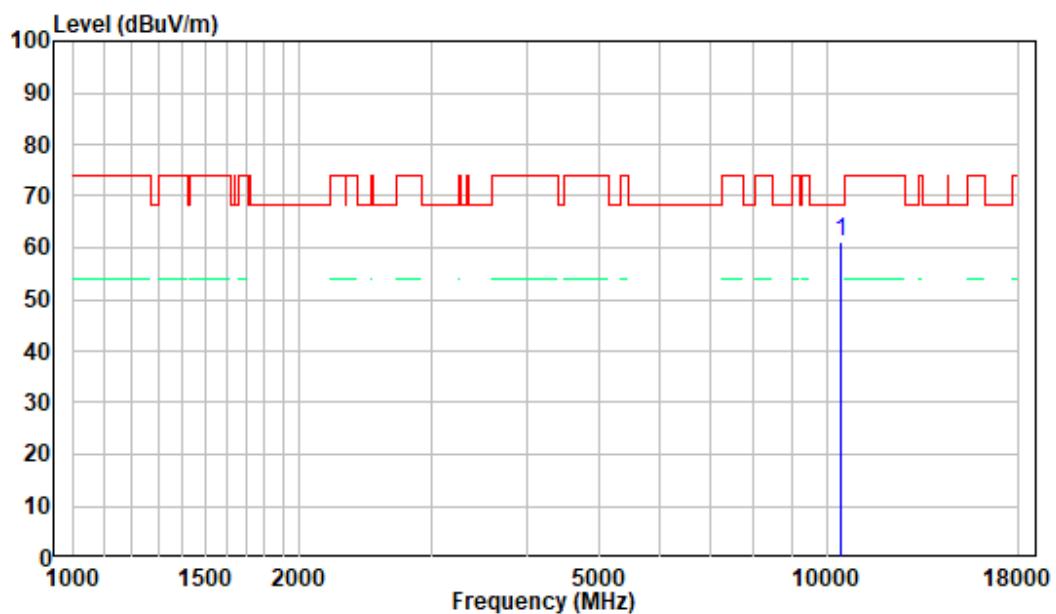
Margin = Corrected. Amplitude - Limit

The other spurious emission which is in the noise floor level was not recorded.

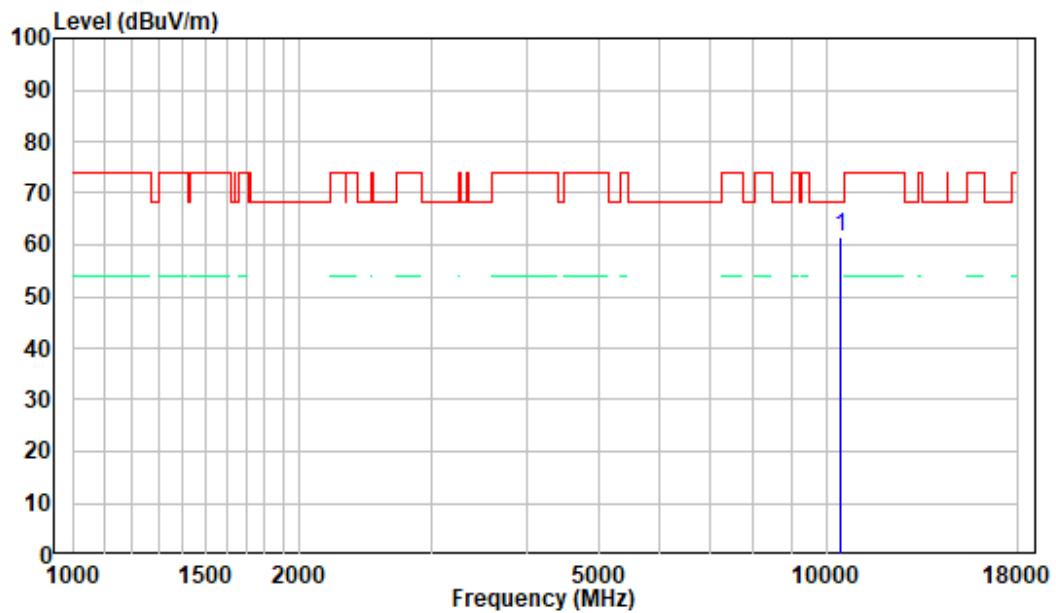
1 GHz - 18 GHz: (Pre-Scan plots)

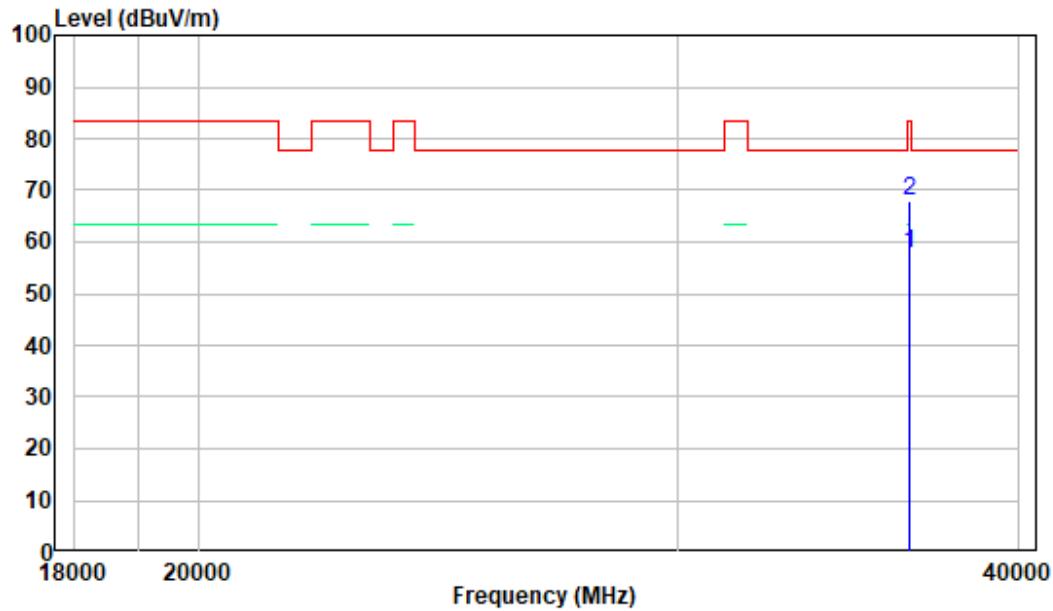
802.11 ac20, 5240MHz

Horizontal

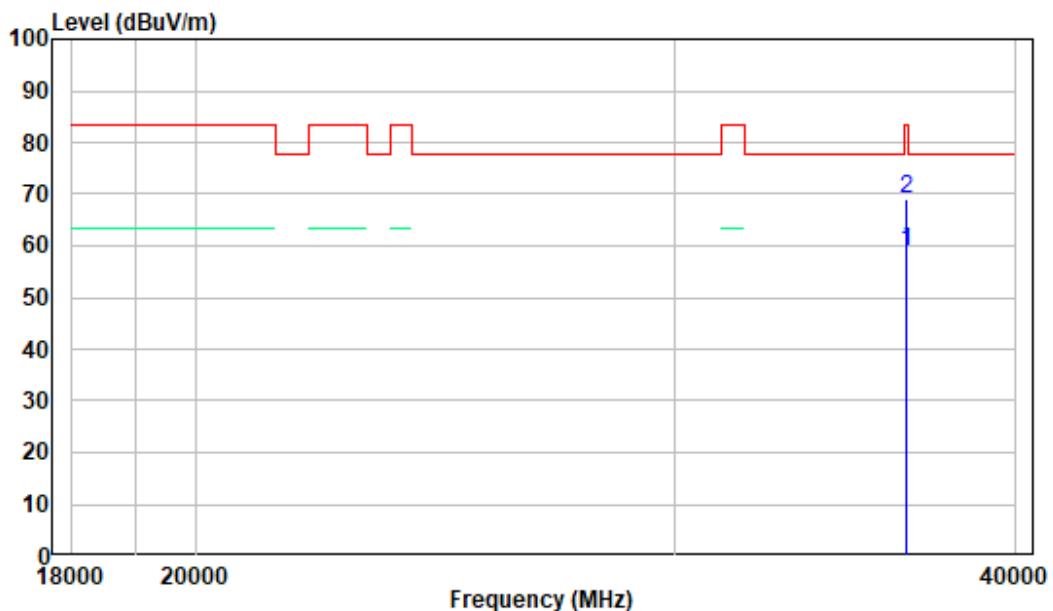


Vertical



18-40GHz: (Pre-Scan plots)802.11 ac20, 5240MHz
Horizontal

Vertical



FCC §15.407(a),(e) – 26 dB & 6dB EMISSION BANDWIDTH

Applicable Standard

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

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

Test Procedure

According to KDB789033 D02 section II.C and section II.D

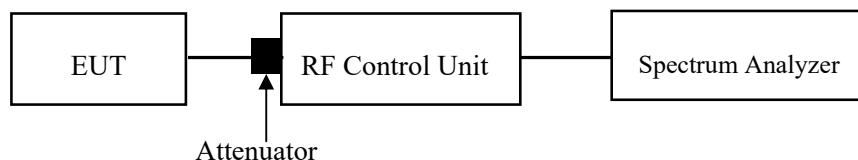
1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW \geq RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB 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 5.725-5.85 GHz

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

- a) Set RBW = 100 kHz.
- 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 6 dB relative to the maximum level measured in the fundamental emission.



Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-13.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm 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 6 dBi.

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm 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 6 dBi.

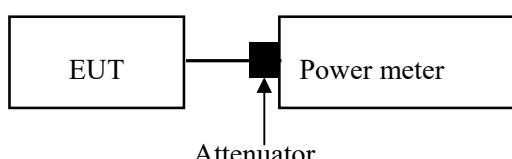
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm 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 6 dBi.

For the band 5.725-5.85 GHz, 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 30 dBm in any 500-kHz 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 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi 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.

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method PM-G should be applied

- 1: Place the EUT on a bench and set it in transmitting mode.
- 2: Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.



Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-13.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a) - POWER SPECTRAL DENSITY

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm 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 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm 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 6 dBi.

For the band 5.725-5.85 GHz, 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 30 dBm in any 500-kHz 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 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi 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.

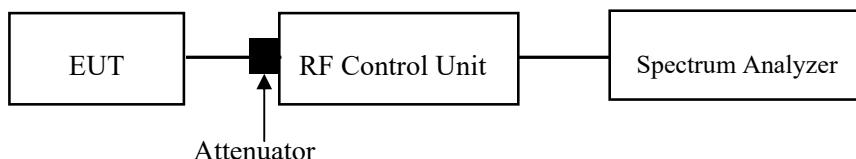
Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-2 should be applied

- a) Set RBW=1MHz or 500 kHz. $\text{VBW} > 3 \text{ RBW}$
- b) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz RBW})$ to the measured result. Where as RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- c) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log (1\text{MHz}/\text{RBW})$ to the measured result, whereas RBW (<1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement. f) Detector=power averaging(1ms)
- d) 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 100 kHz for the II.F.5.c) and ILF 5.d. since RBW=100 kHz is available on nearly all spectrum analyzers.

- h) Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.



Test Data

Environmental Conditions

Temperature:	24 °C
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

The testing was performed by Jacob Huang on 2023-05-13.

EUT operation mode: Transmitting

Test Result: Pass

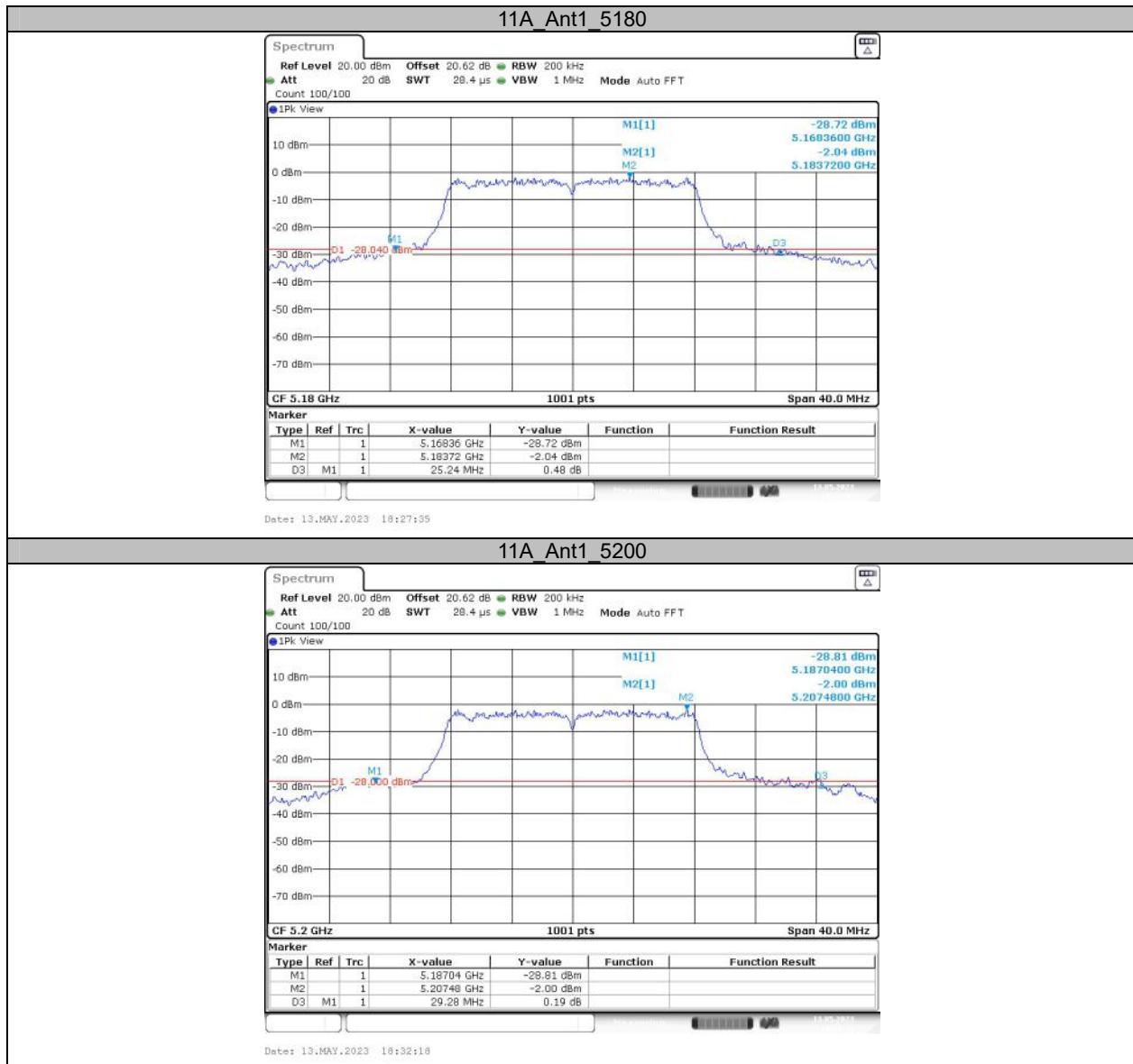
Please refer to the Appendix.

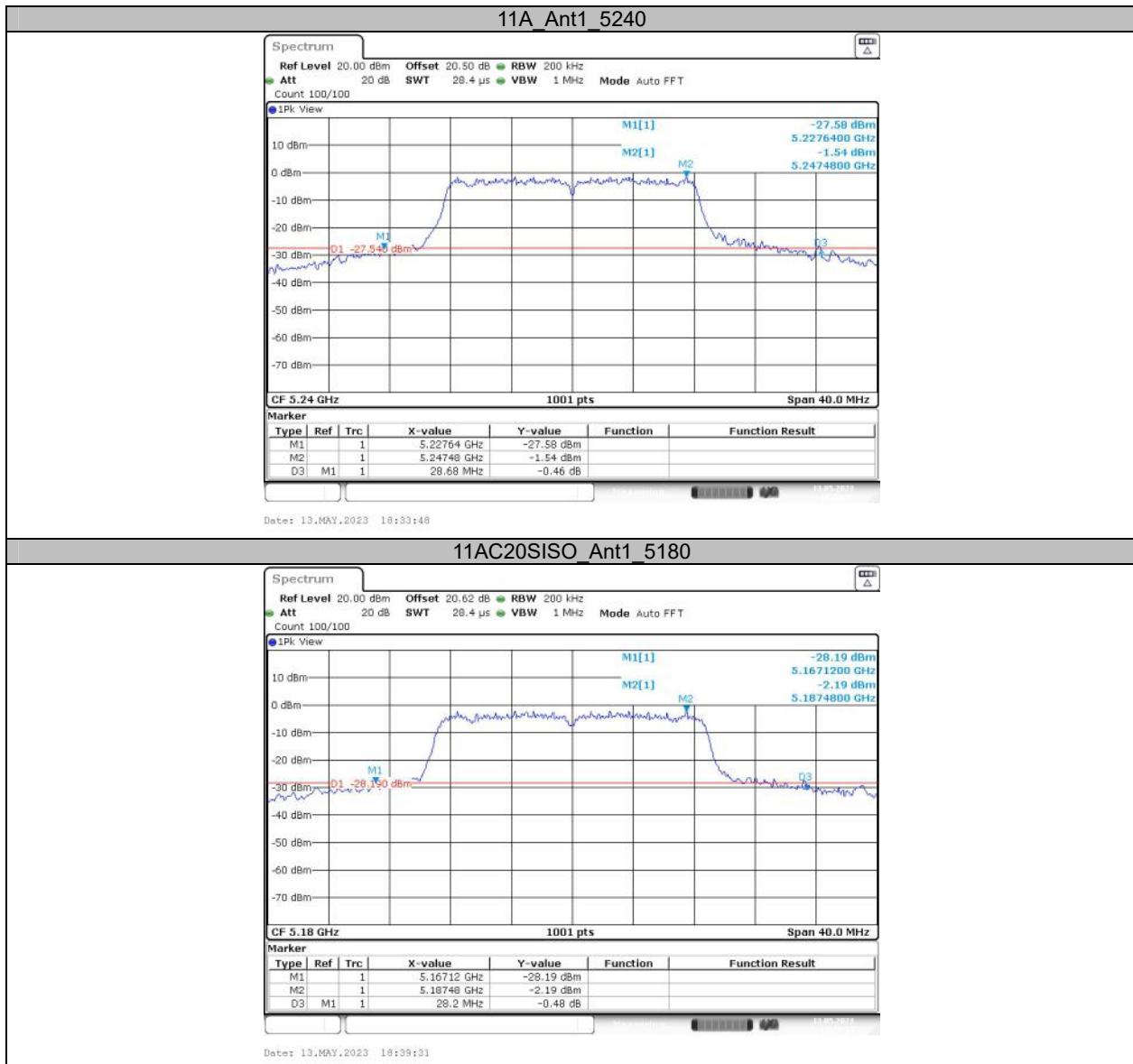
APPENDIX

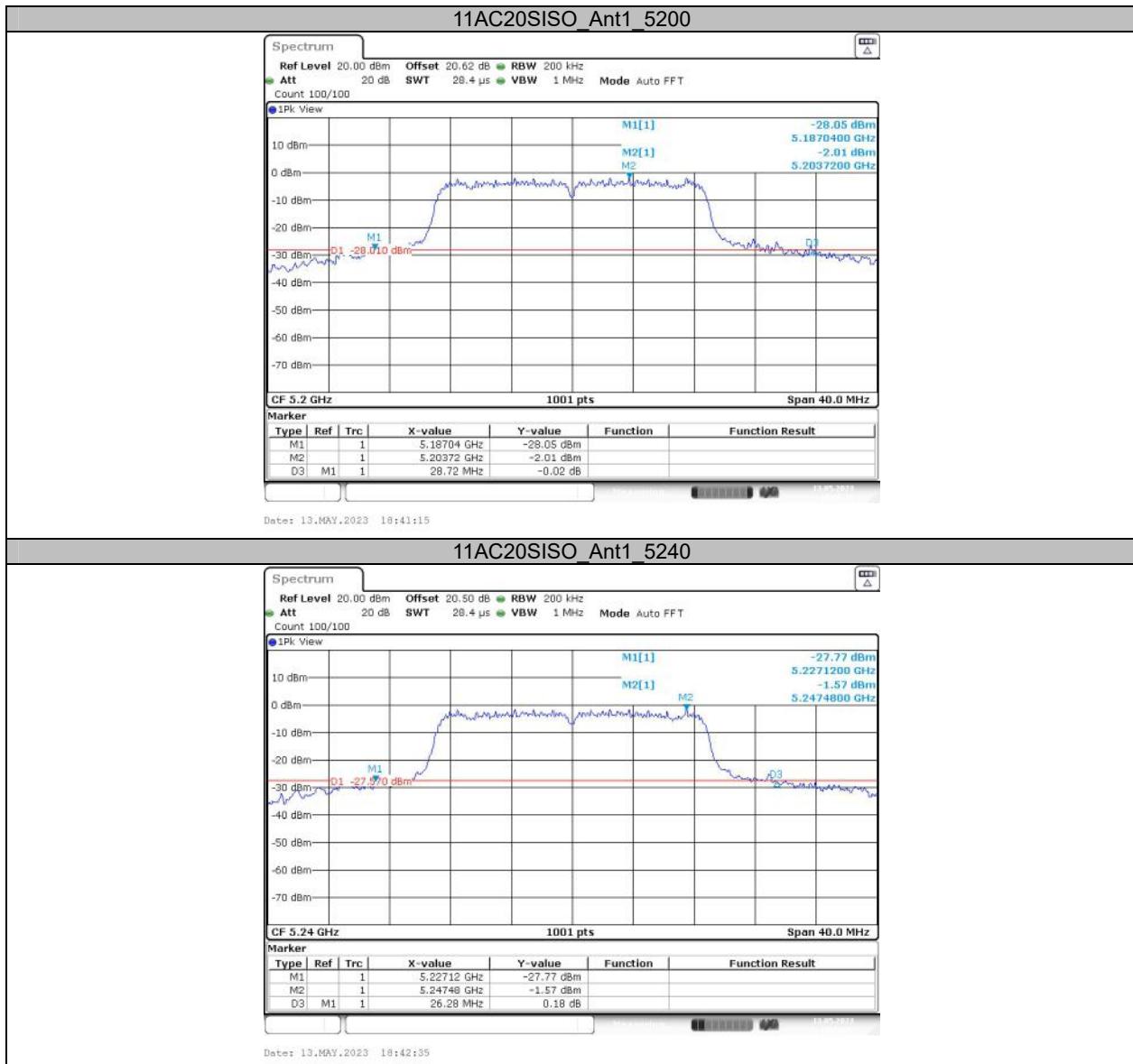
Appendix A1: Emission Bandwidth Test Result

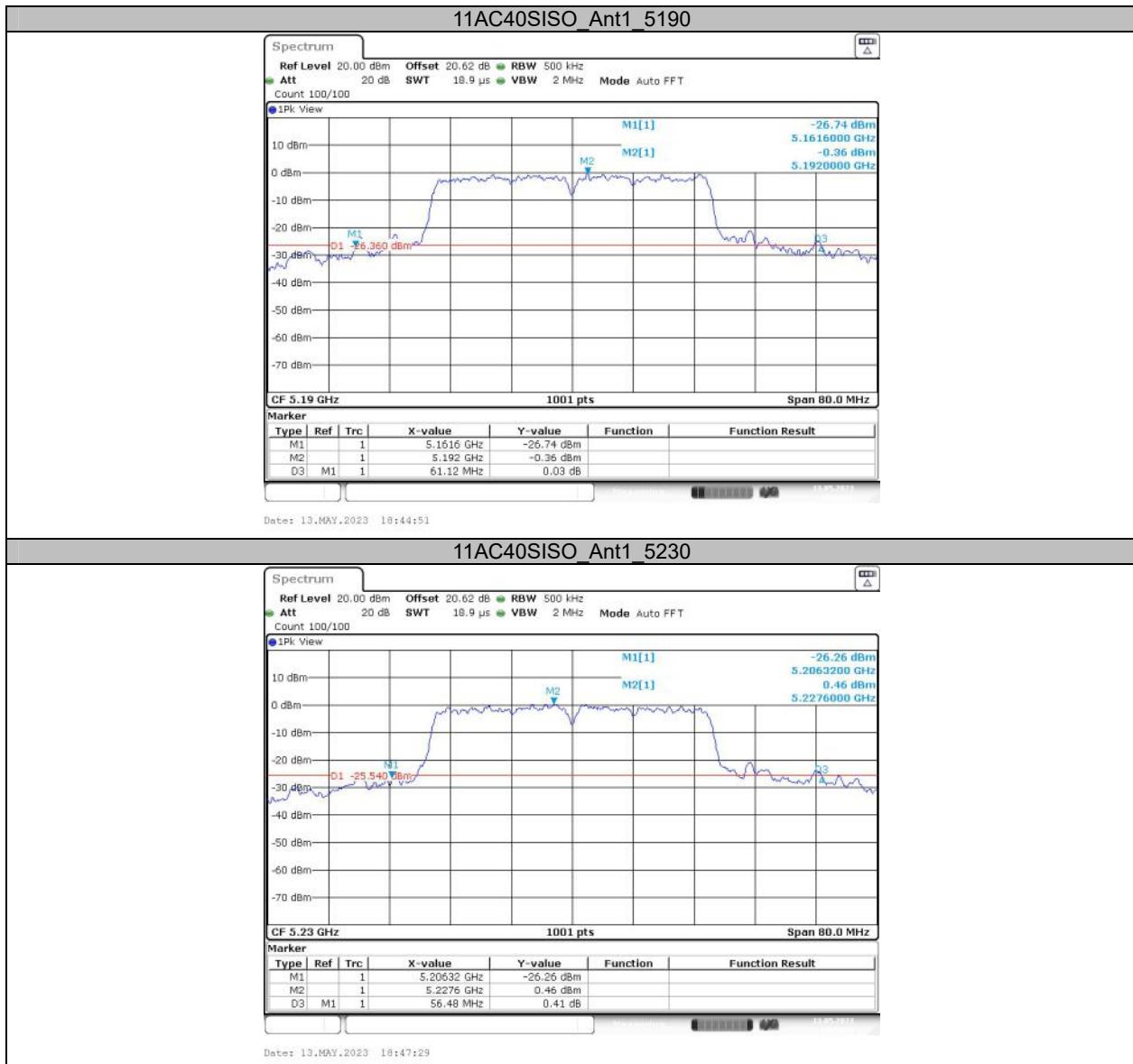
Test Mode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	25.24	5168.36	5193.60	---	---
		5200	29.28	5187.04	5216.32	---	---
		5240	28.68	5227.64	5256.32	---	---
11AC20SISO	Ant1	5180	28.20	5167.12	5195.32	---	---
		5200	28.72	5187.04	5215.76	---	---
		5240	26.28	5227.12	5253.40	---	---
11AC40SISO	Ant1	5190	61.12	5161.60	5222.72	---	---
		5230	56.48	5206.32	5262.80	---	---
11AC80SISO	Ant1	5210	89.60	5164.40	5254.00	---	---

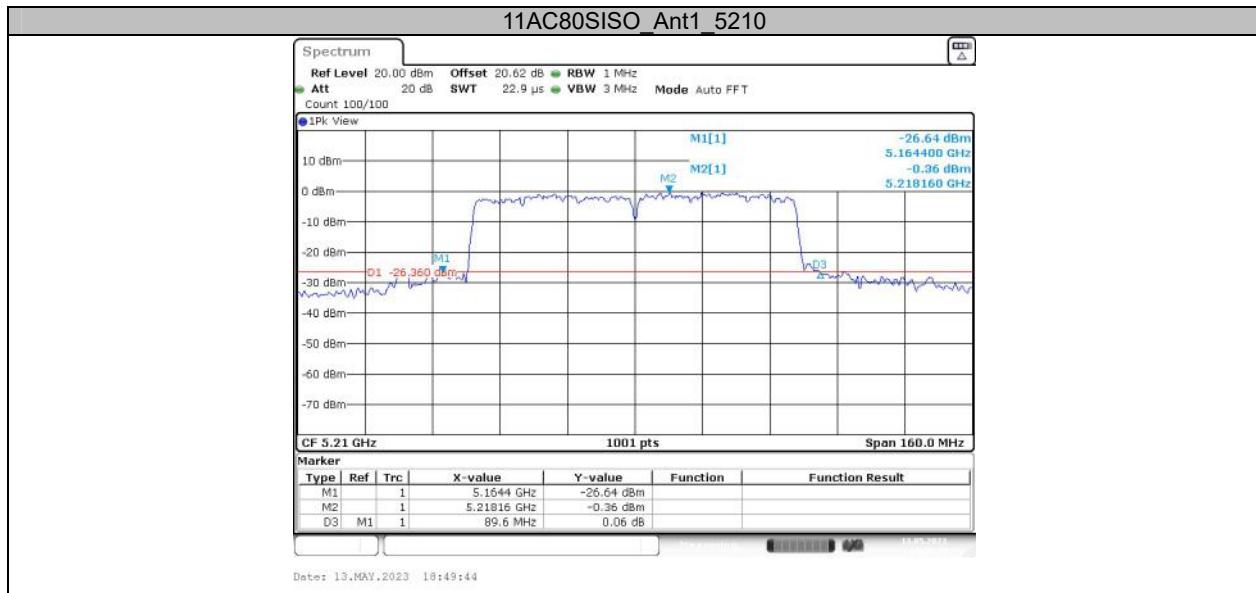
Test Graphs









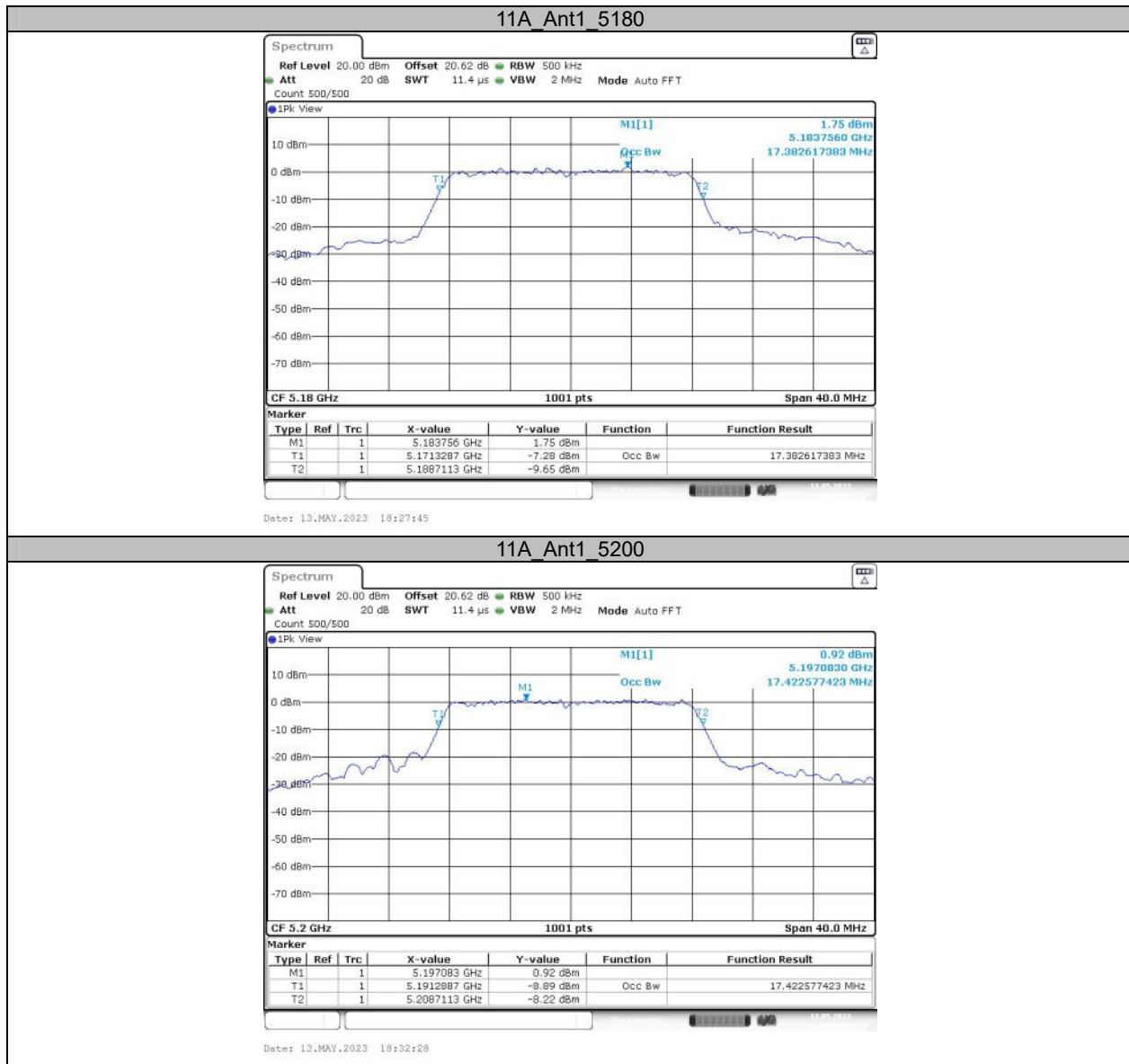


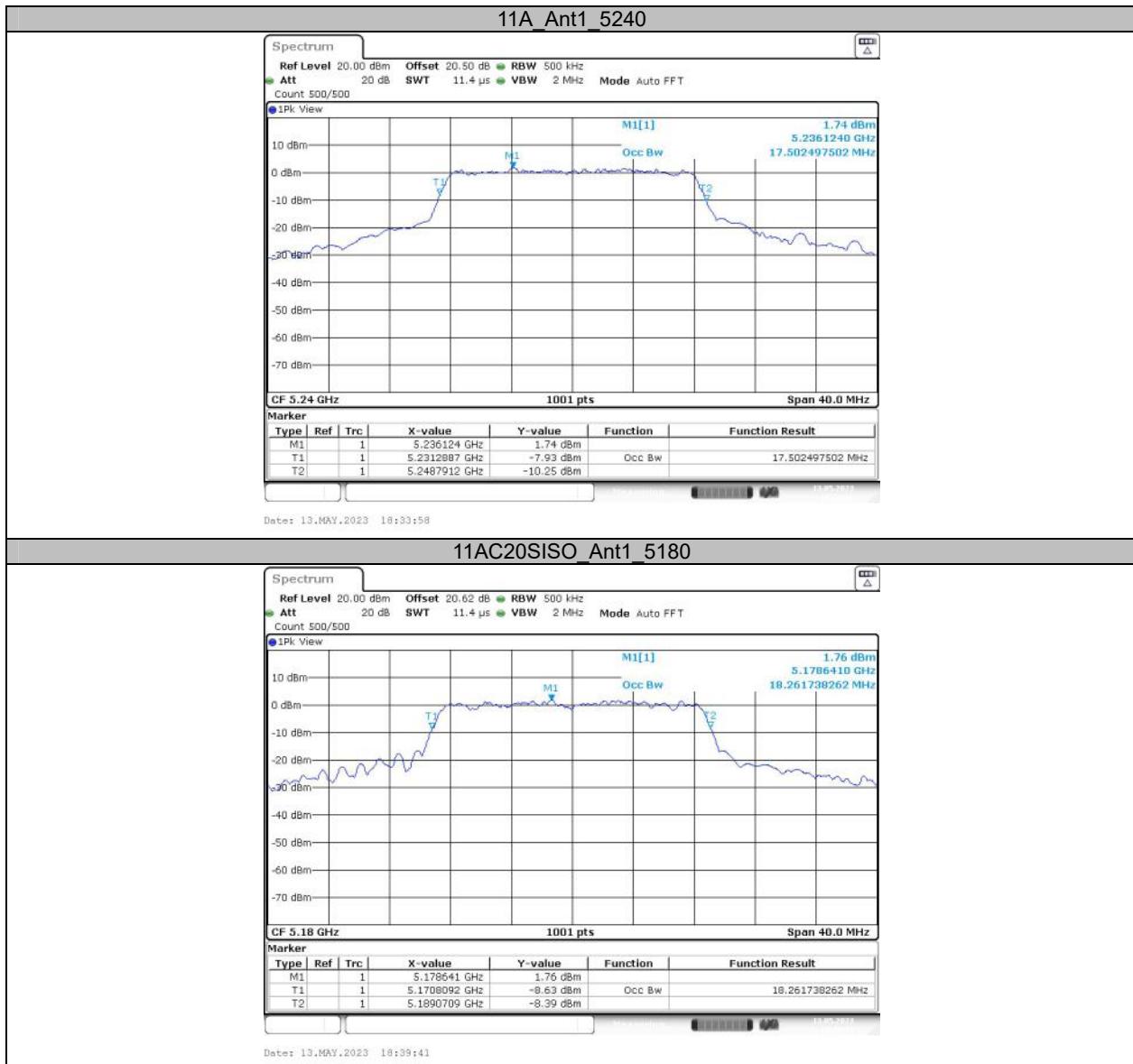
Appendix A2: Occupied channel bandwidth Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.383	5171.329	5188.711	---	---
		5200	17.423	5191.289	5208.711	---	---
		5240	17.502	5231.289	5248.791	---	---
11AC20SISO	Ant1	5180	18.262	5170.809	5189.071	---	---
		5200	18.062	5191.009	5209.071	---	---
		5240	18.022	5230.969	5248.991	---	---
11AC40SISO	Ant1	5190	36.923	5171.618	5208.541	---	---
		5230	36.523	5211.778	5248.302	---	---
11AC80SISO	Ant1	5210	75.924	5172.278	5248.202	---	---

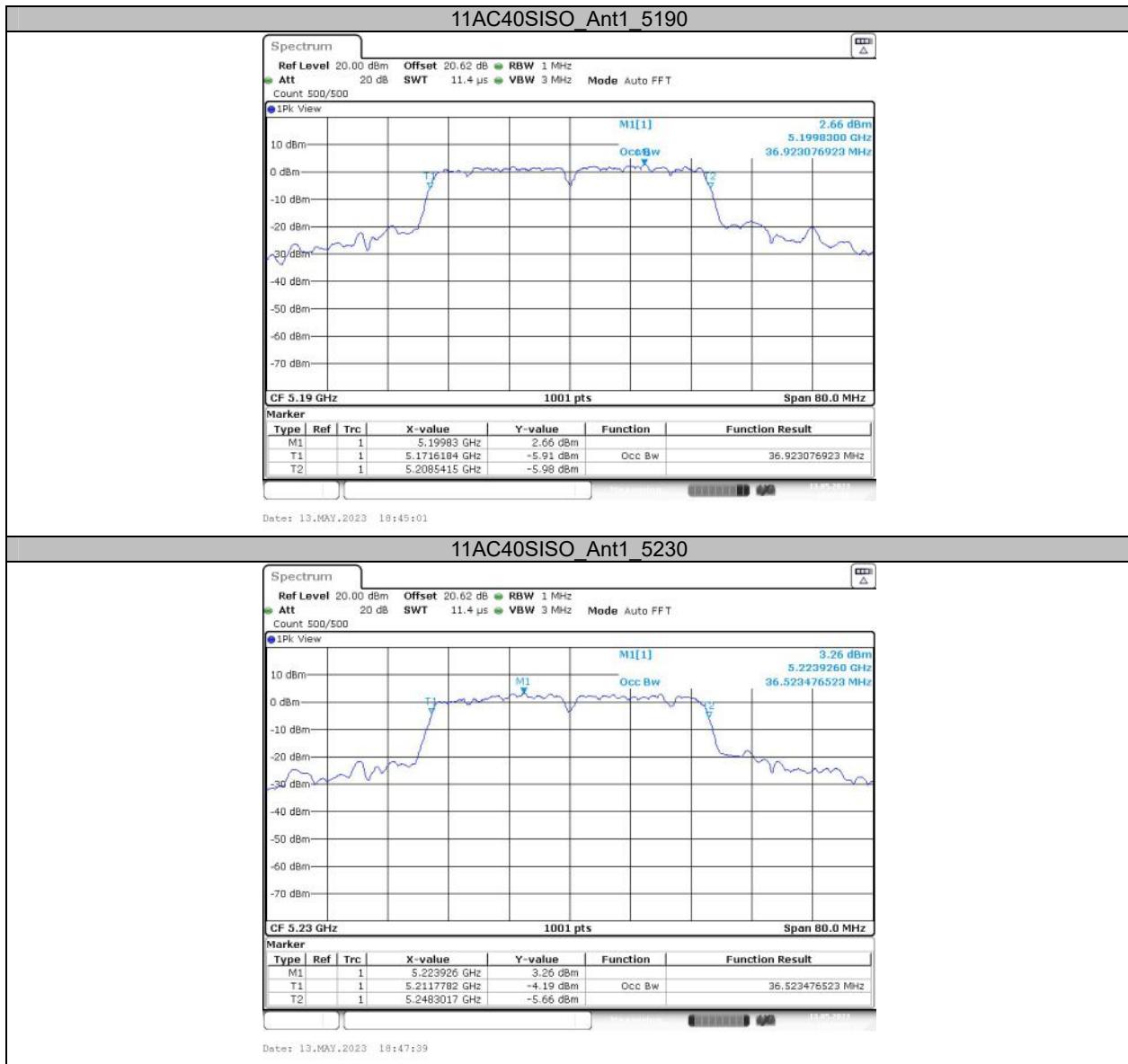
Note: the EUT not operating with any part of OBW within 5250-5350MHz.

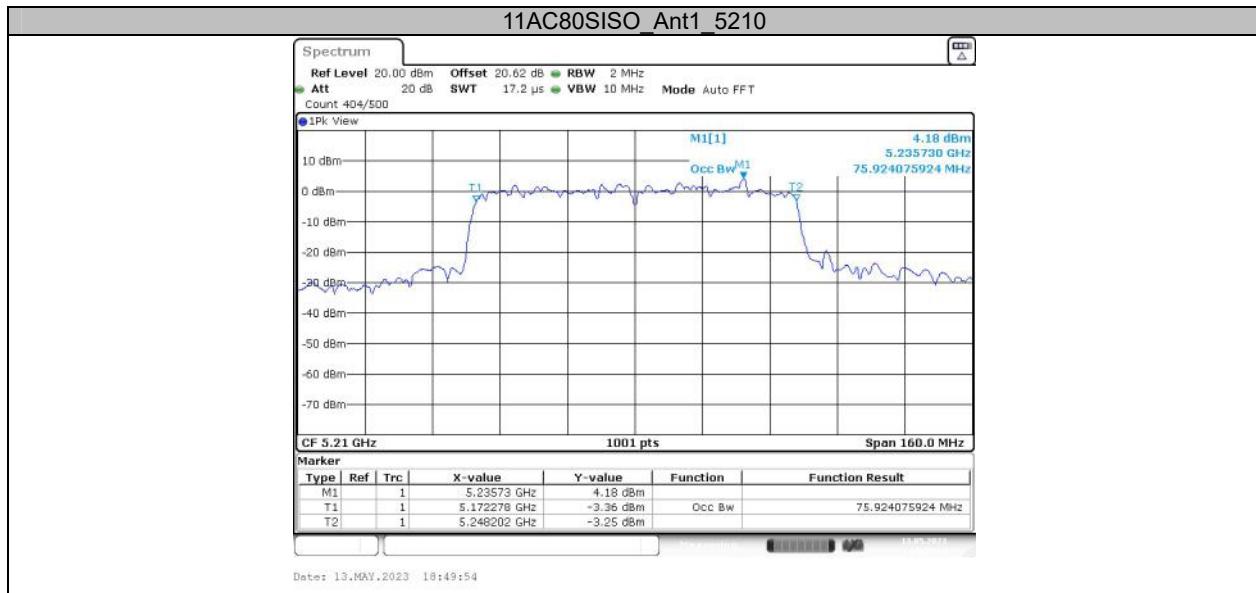
Test Graphs







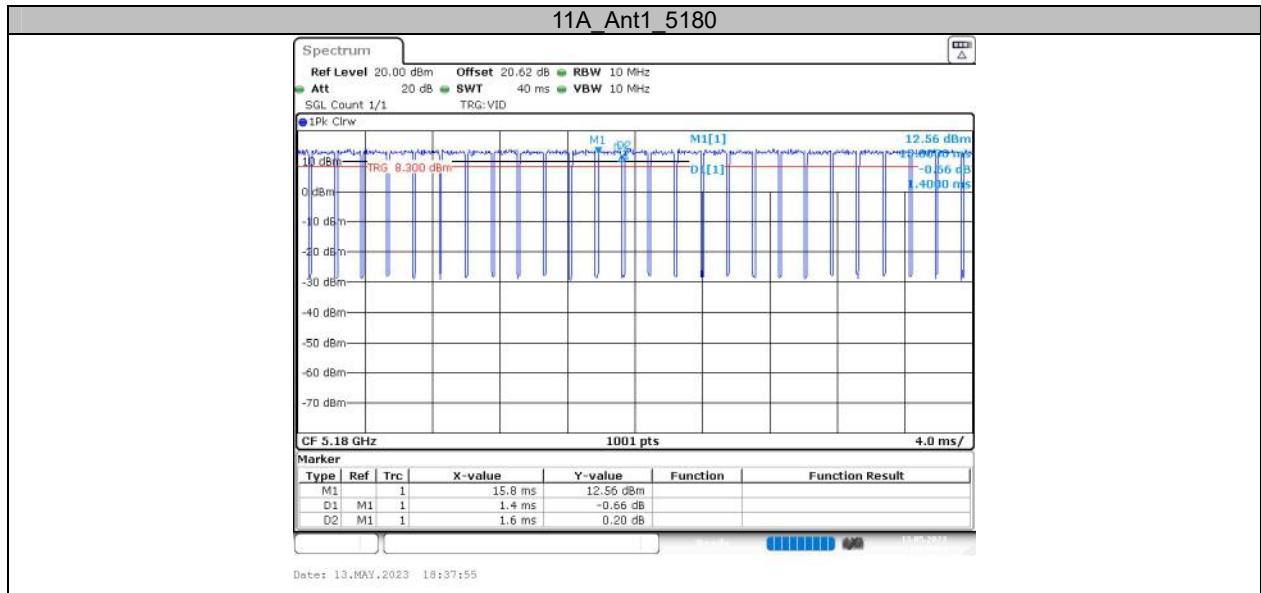




Appendix B: Duty Cycle Test Result

Test Mode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]	1/T Minimum VBW(kHz)
11A	Ant1	5180	1.40	1.60	87.50	0.58	0.714
		5200	1.36	1.52	89.47	0.48	0.735
		5240	1.36	1.52	89.47	0.48	0.735
11AC20SISO	Ant1	5180	1.16	1.36	85.29	0.69	0.862
		5200	1.16	1.32	87.88	0.56	0.862
		5240	1.16	1.36	85.29	0.69	0.862
11AC40SISO	Ant1	5190	0.56	0.72	77.78	1.09	1.786
		5230	0.56	0.72	77.78	1.09	1.786
11AC80SISO	Ant1	5210	0.28	0.44	63.64	1.96	3.571

Test Graphs











Appendix C: Maximum conducted output power

Test Mode	Antenna	Frequency[MHz]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	8.41	≤23.98	PASS
		5200	8.35	≤23.98	PASS
		5240	8.83	≤23.98	PASS
11AC20SISO	Ant1	5180	8.35	≤23.98	PASS
		5200	8.33	≤23.98	PASS
		5240	8.96	≤23.98	PASS
11AC40SISO	Ant1	5190	8.73	≤23.98	PASS
		5230	9.31	≤23.98	PASS
11AC80SISO	Ant1	5210	9.21	≤23.98	PASS

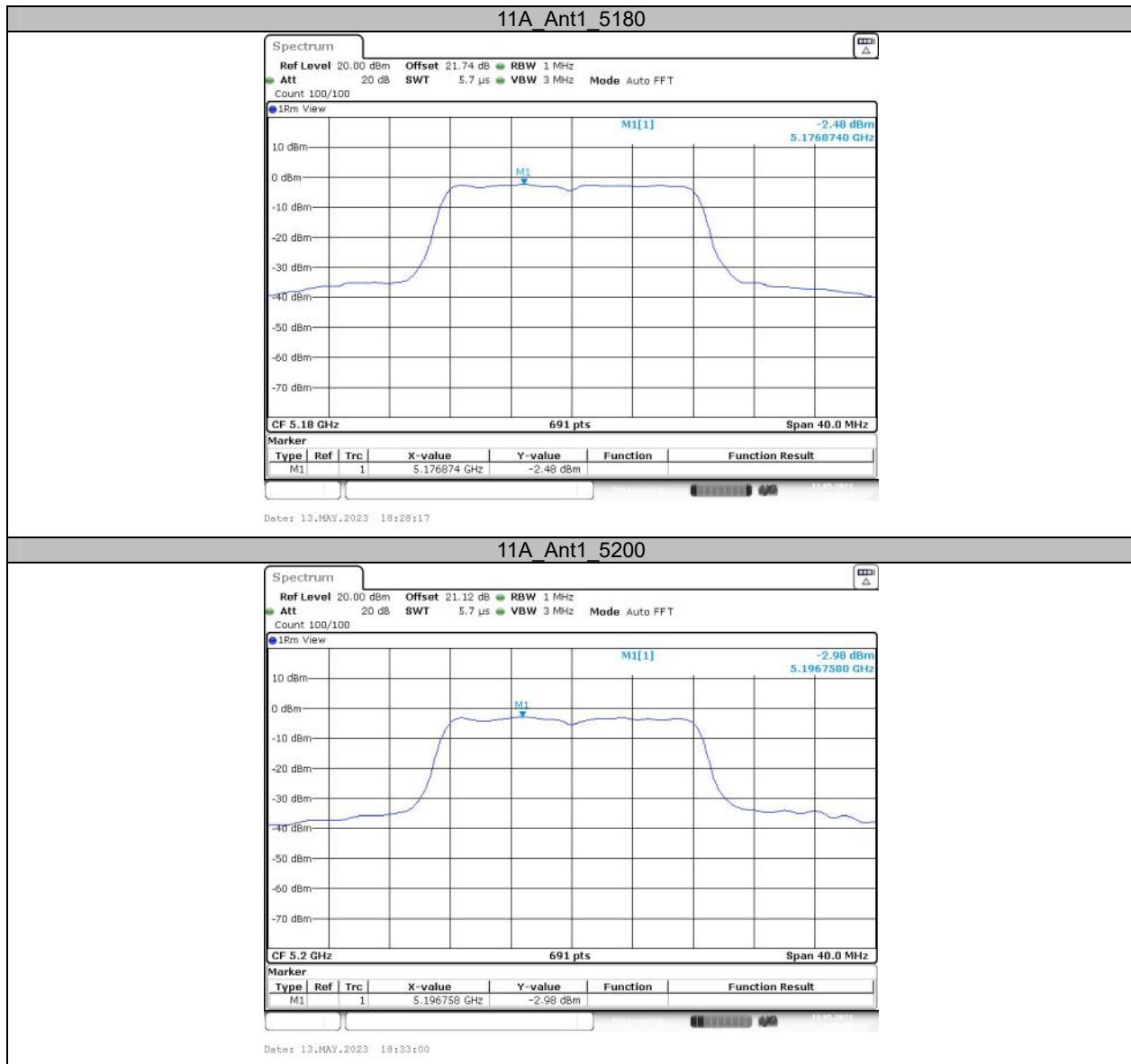
Note: The Duty Cycle Factor is compensated in the result.

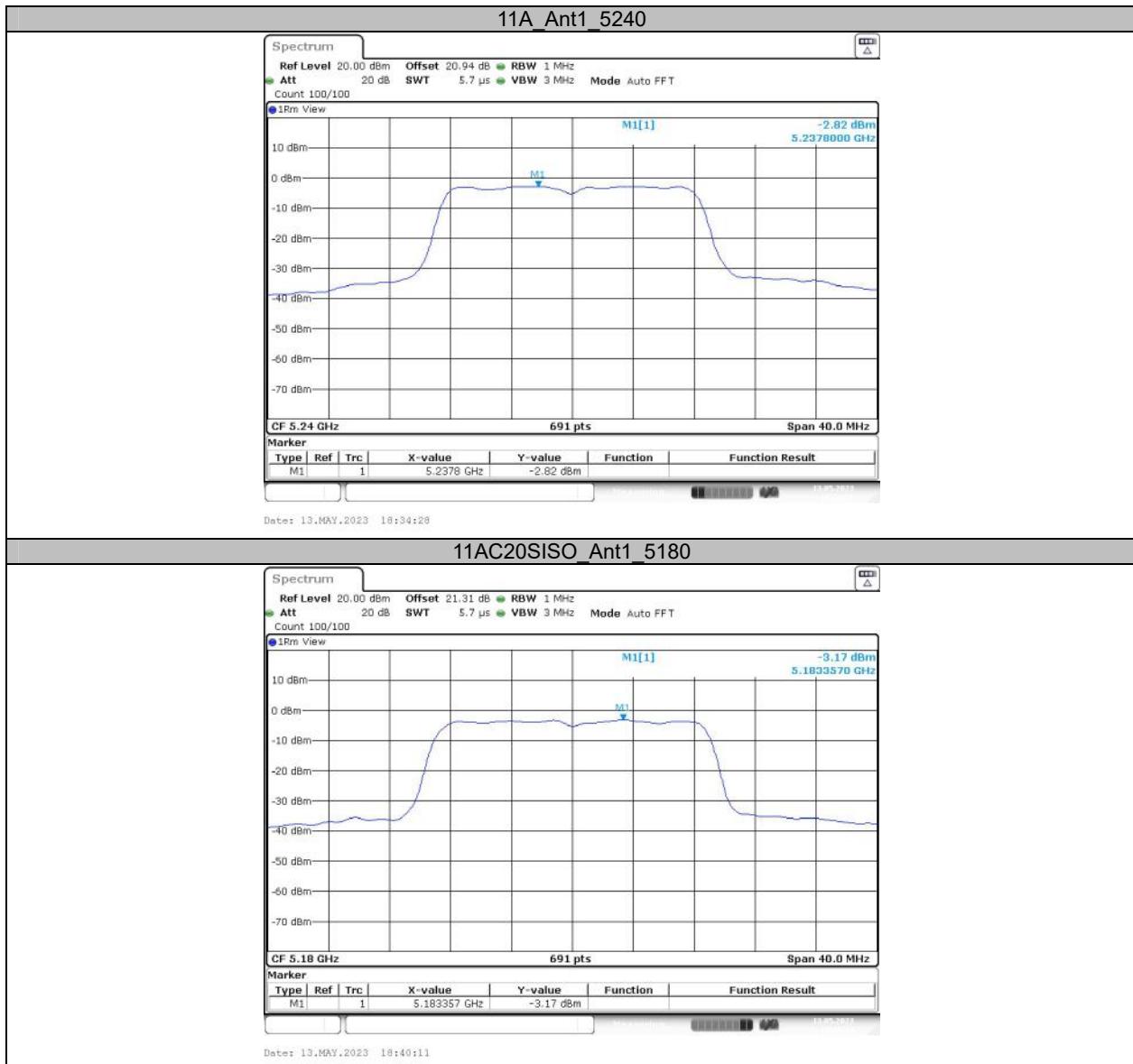
**Appendix D: Maximum power spectral density
Test Result**

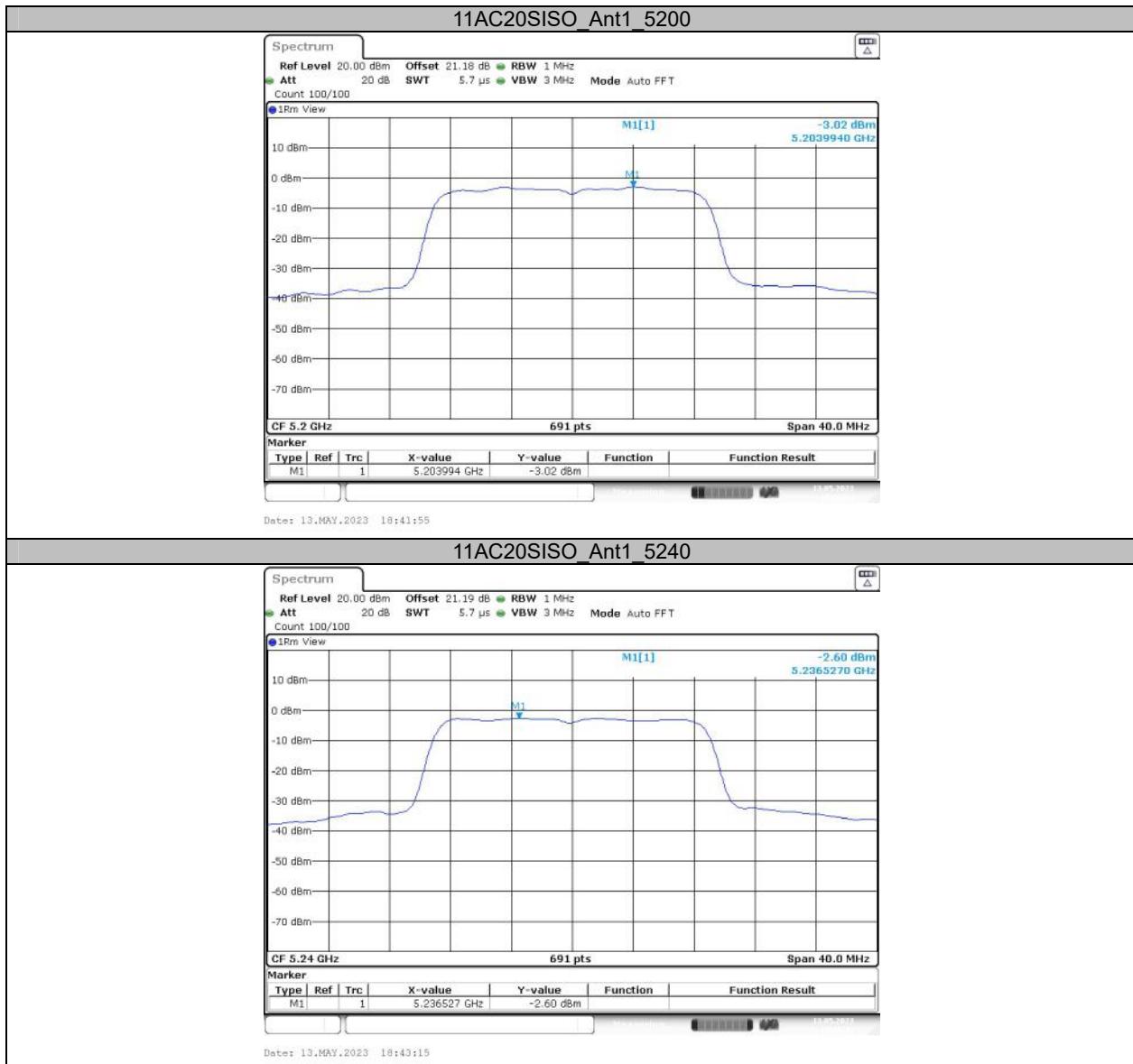
Test Mode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	-2.48	≤11.00	PASS
		5200	-2.98	≤11.00	PASS
		5240	-2.82	≤11.00	PASS
11AC20SISO	Ant1	5180	-3.17	≤11.00	PASS
		5200	-3.02	≤11.00	PASS
		5240	-2.60	≤11.00	PASS
11AC40SISO	Ant1	5190	-5.53	≤11.00	PASS
		5230	-4.77	≤11.00	PASS
11AC80SISO	Ant1	5210	-8.17	≤11.00	PASS

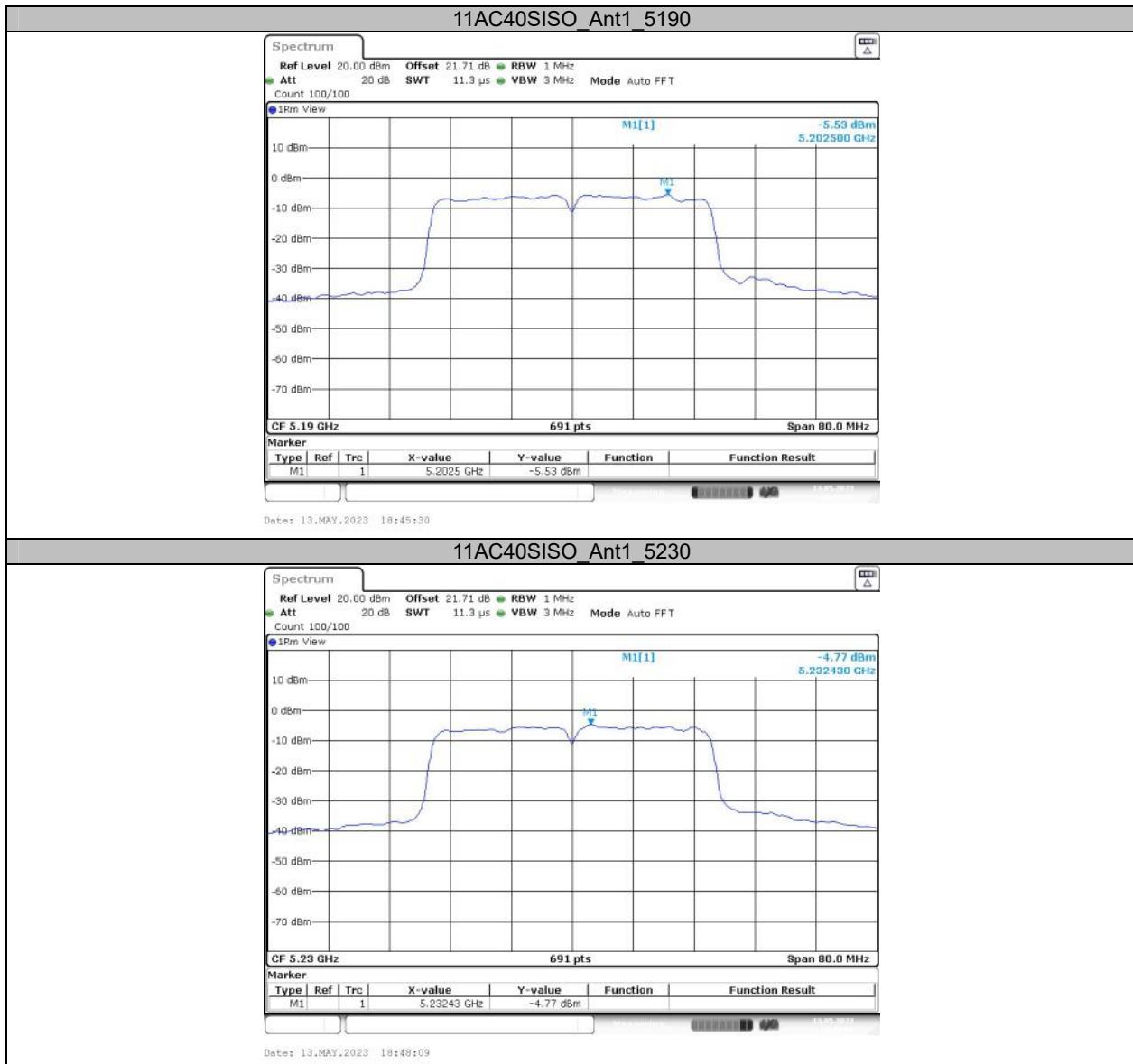
Note: The Duty Cycle Factor is compensated in the graph.

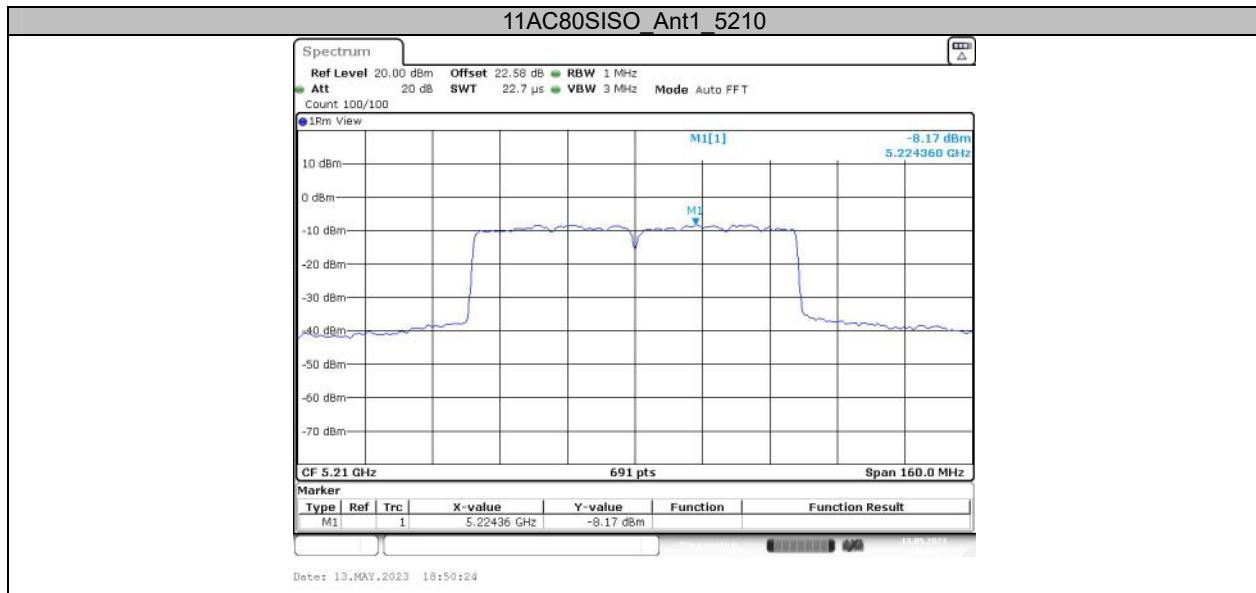
Test Graphs











***** END OF REPORT *****