

TESTREPORT

Applicant Name : Shenzhen Youmi Intelligent Technology Co., Ltd.
Address : 406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Report Number: RA230620-35489E-RF-00D
FCC ID: 2ATZ4-G5Z23

Test Standard (s)

FCC PART 15.407

Sample Description

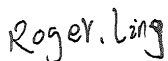
Product Type: Smart phone
Model No.: G5A
Multiple Model(s) No.: N/A
Trade Mark: UMIDIGI
Date Received: 2023/06/20
Report Date: 2023/07/21

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

Prepared and Checked By:

Approved By:



Roger Ling
EMC Engineer

Candy Li
EMC Engineer

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

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230620-35489E-RF-00D	Original Report	2023/07/21

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	5G Wi-Fi: 5150-5250MHz; 5725-5850MHz
Mode	802.11a/n20/n40/ac20/ac40/ac80
Maximum Conducted Average Output Power	5150-5250 MHz: 8.59dBm 5725-5850 MHz: 10.43dBm
Modulation Technique	OFDM
Antenna Specification*	1.23dBi (It is provided by the applicant)
Voltage Range	DC3.85V from battery or DC5V from adapter
Sample serial number	CE&RE: 281O-1 RF: 281O-2 (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter 1 information	Model: HF-0502000U Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5.0V, 2A
Adapter 2 information	Model: HJ-0502000W2-US Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5V, 2A

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
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 was 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.

For 5725-5850MHz Band, 8 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785
151	5755	159	5795
153	5765	161	5805
155	5775	165	5825

For 802.11a/ac20 mode: channel 149, 157, 165 were tested;

For 802.11ac40 mode: channel 151, 159 were tested;

For 802.11ac80 mode, channel 155 was tested.

EUT Exercise Software

EUT was test in engineering mode. The worst case was performed under:

U-NII	Mode	Data rate	Power Level*		
			Low Channel	Middle Channel	High Channel
5150 – 5250MHz	802.11a	6Mbps	Default	Default	Default
	802.11ac20	MCS0	Default	Default	Default
	802.11ac40	MCS0	Default	/	Default
	802.11ac80	MCS0	/	Default	/
5725 – 5850MHz	802.11a	6Mbps	Default	Default	Default
	802.11ac20	MCS0	Default	Default	Default
	802.11ac40	MCS0	Default	/	Default
	802.11ac80	MCS0	/	Default	/

Note: the power level was provided by the applicant.

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

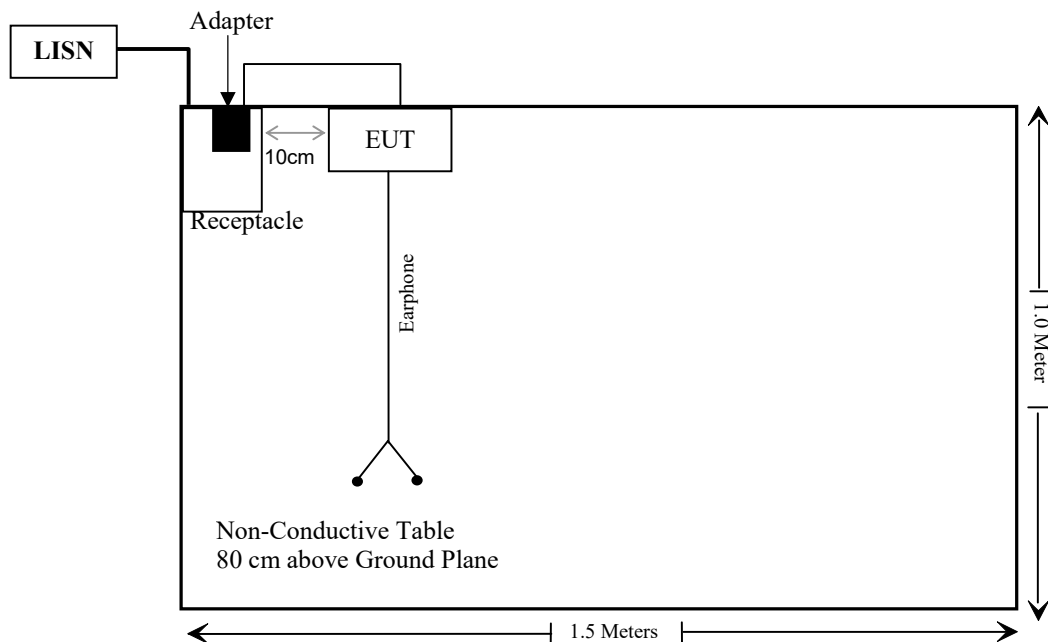
Manufacturer	Description	Model	Serial Number
Unknown	Earphone	Unknown	Unknown

External I/O Cable

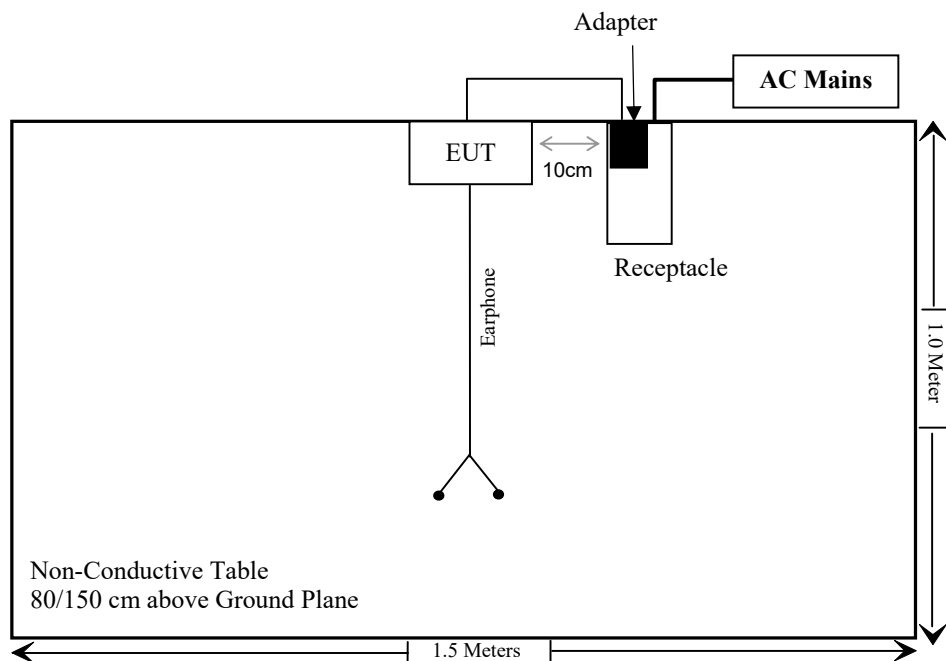
Cable Description	Length (m)	From/Port	To
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For conducted emissions:



For Radiated Emissions:



Note: the support table edge was flush with the 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.	ENV216	101314	2022/11/25	2023/11/24
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	9120D-1067	2022/11/30	2025/11/29
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
CD	Band Reject Filter	BRM-5.725/5.875G-45	065	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
Anritsu	Microwave Peak Power Sensor	MA24418A	12619	2023/05/09	2024/05/08
HP	20dB Attenuator	8491A	53857	2022/11/25	2023/11/24

* **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: RA230620-35489E-SA.

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	1.23dBi	50Ω	5150-5850MHz

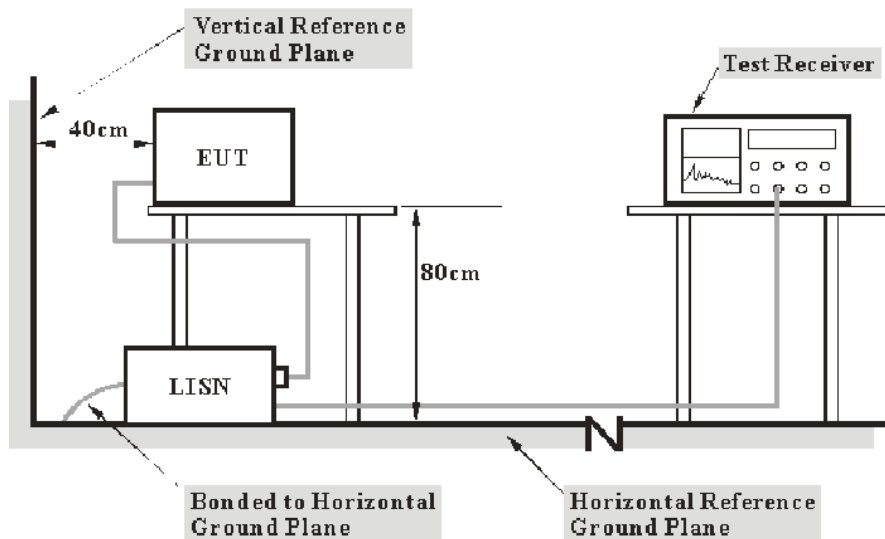
Result: Compliant.

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 & Over Limit 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:

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

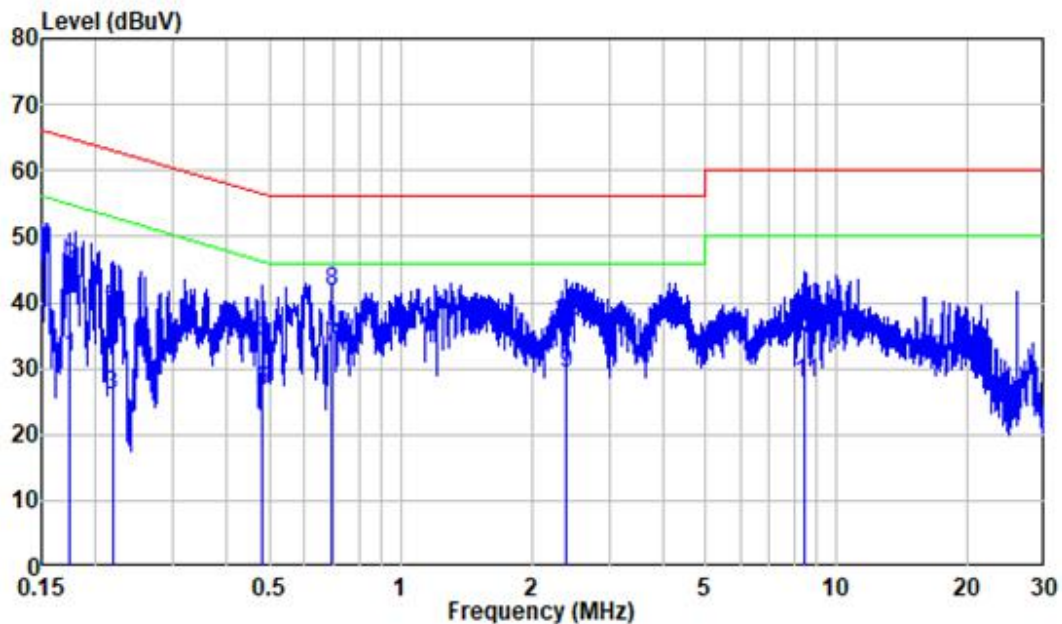
Test Data

Environmental Conditions

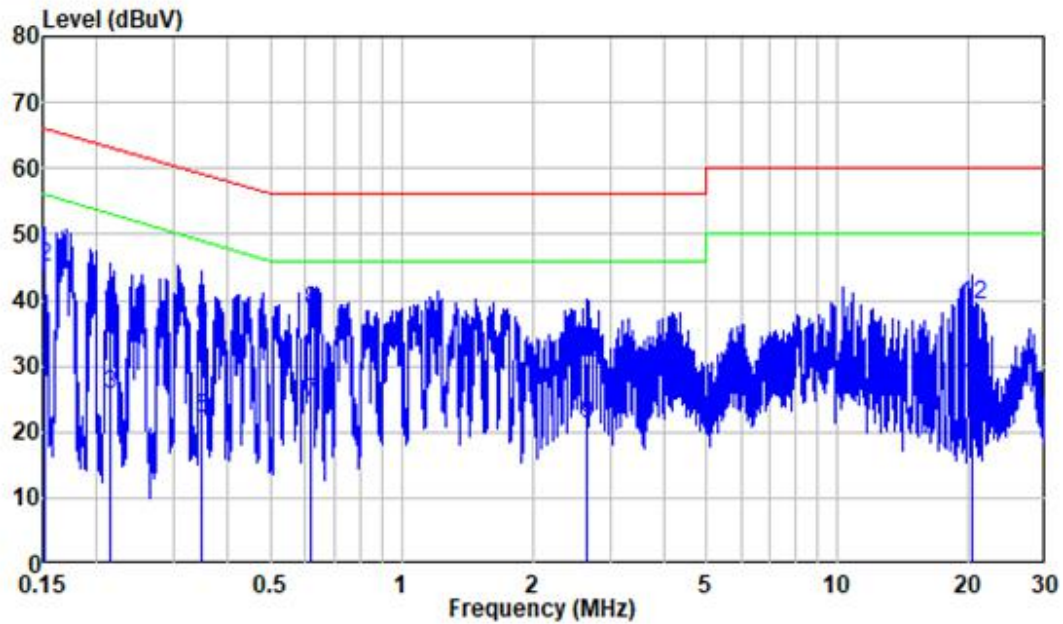
Temperature:	24 °C
Relative Humidity:	48 %
ATM Pressure:	100.19 kPa

The testing was performed by Jeef Huang on 2023-07-18.

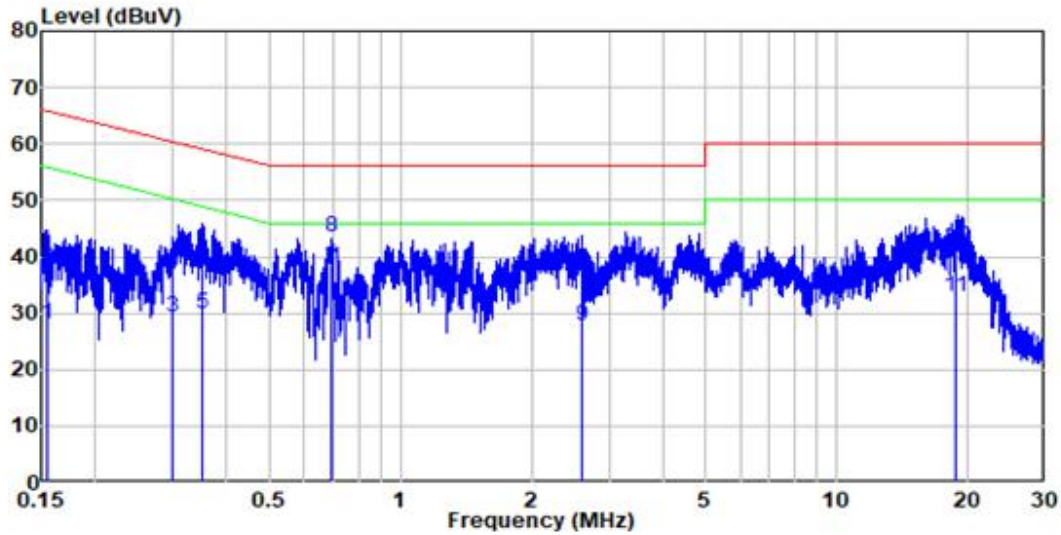
EUT operation mode: Transmitting (802.11a, 5180MHz)

Adapter 1:**AC 120V/60 Hz, Line:**

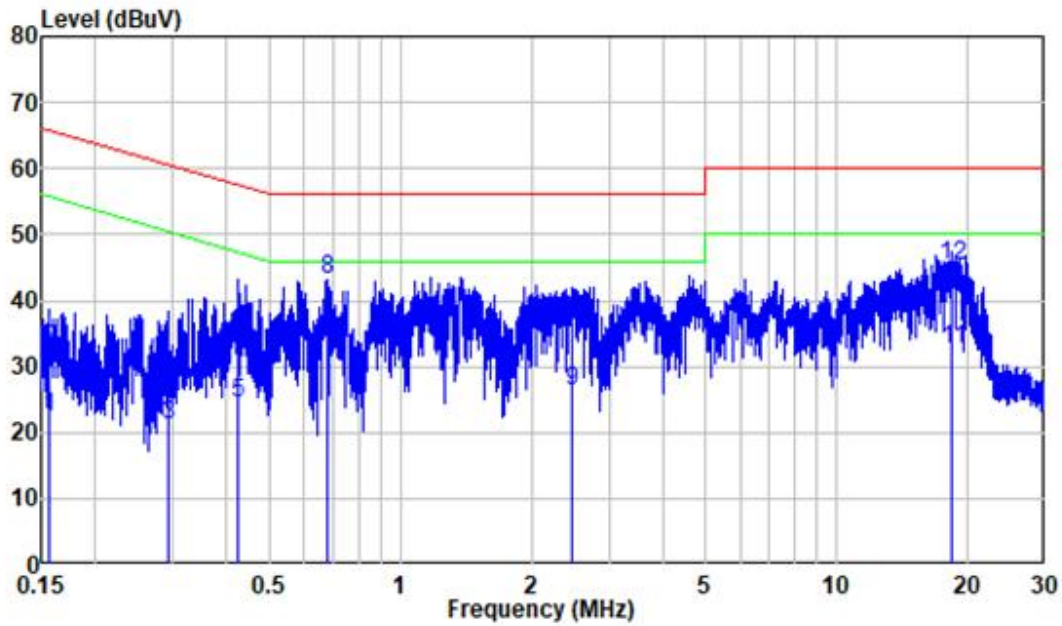
	Freq	Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.174	10.33	21.51	31.84	54.76	-22.92	Average
2	0.174	10.33	35.08	45.41	64.76	-19.35	QP
3	0.218	10.31	15.74	26.05	52.90	-26.85	Average
4	0.218	10.31	29.59	39.90	62.90	-23.00	QP
5	0.480	10.55	15.97	26.52	46.33	-19.81	Average
6	0.480	10.55	23.46	34.01	56.33	-22.32	QP
7	0.694	10.67	22.46	33.13	46.00	-12.87	Average
8	0.694	10.67	30.93	41.60	56.00	-14.40	QP
9	2.404	10.44	18.72	29.16	46.00	-16.84	Average
10	2.404	10.44	26.84	37.28	56.00	-18.72	QP
11	8.467	10.62	17.30	27.92	50.00	-22.08	Average
12	8.467	10.62	26.00	36.62	60.00	-23.38	QP

AC 120V/60 Hz, Neutral:

	Freq Factor		Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.152	10.27	18.91	29.18	55.90	-26.72	Average
2	0.152	10.27	34.72	44.99	65.90	-20.91	QP
3	0.215	10.30	15.26	25.56	53.02	-27.46	Average
4	0.215	10.30	29.08	39.38	63.02	-23.64	QP
5	0.349	10.39	11.72	22.11	49.00	-26.89	Average
6	0.349	10.39	25.48	35.87	59.00	-23.13	QP
7	0.620	10.47	13.94	24.41	46.00	-21.59	Average
8	0.620	10.47	27.81	38.28	56.00	-17.72	QP
9	2.671	10.52	10.57	21.09	46.00	-24.91	Average
10	2.671	10.52	19.95	30.47	56.00	-25.53	QP
11	20.310	10.23	16.76	26.99	50.00	-23.01	Average
12	20.310	10.23	29.16	39.39	60.00	-20.61	QP

Adapter 2:**AC 120V/60 Hz, Line:**

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.155	10.37	17.85	28.22	55.71	-27.49	Average
2	0.155	10.37	27.53	37.90	65.71	-27.81	QP
3	0.299	10.40	18.88	29.28	50.27	-20.99	Average
4	0.299	10.40	27.82	38.22	60.27	-22.05	QP
5	0.350	10.45	19.51	29.96	48.95	-18.99	Average
6	0.350	10.45	29.03	39.48	58.95	-19.47	QP
7	0.694	10.67	27.12	37.79	46.00	-8.21	Average
8	0.694	10.67	32.94	43.61	56.00	-12.39	QP
9	2.612	10.46	17.33	27.79	46.00	-18.21	Average
10	2.612	10.46	25.30	35.76	56.00	-20.24	QP
11	18.634	10.29	22.70	32.99	50.00	-17.01	Average
12	18.634	10.29	31.44	41.73	60.00	-18.27	QP

AC 120V/60 Hz, Neutral:

	Freq	Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.157	10.28	12.03	22.31	55.63	-33.32	Average
2	0.157	10.28	22.36	32.64	65.63	-32.99	QP
3	0.292	10.35	10.74	21.09	50.46	-29.37	Average
4	0.292	10.35	17.92	28.27	60.46	-32.19	QP
5	0.423	10.43	14.10	24.53	47.40	-22.87	Average
6	0.423	10.43	23.27	33.70	57.40	-23.70	QP
7	0.678	10.47	23.23	33.70	46.00	-12.30	Average
8	0.678	10.47	32.59	43.06	56.00	-12.94	QP
9	2.464	10.51	15.89	26.40	46.00	-19.60	Average
10	2.464	10.51	26.68	37.19	56.00	-18.81	QP
11	18.365	10.21	22.34	32.55	50.00	-17.45	Average
12	18.365	10.21	35.15	45.36	60.00	-14.64	QP

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

Applicable Standard

FCC §15.407 (b); §15.209; §15.205;

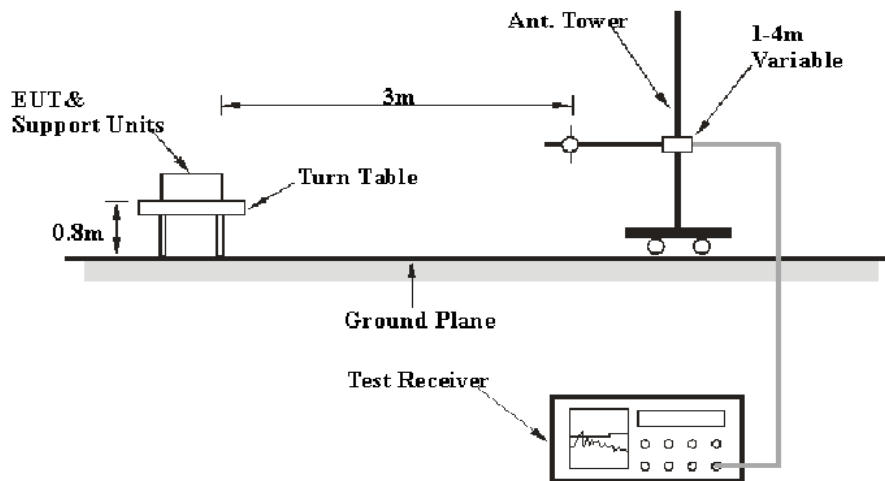
(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

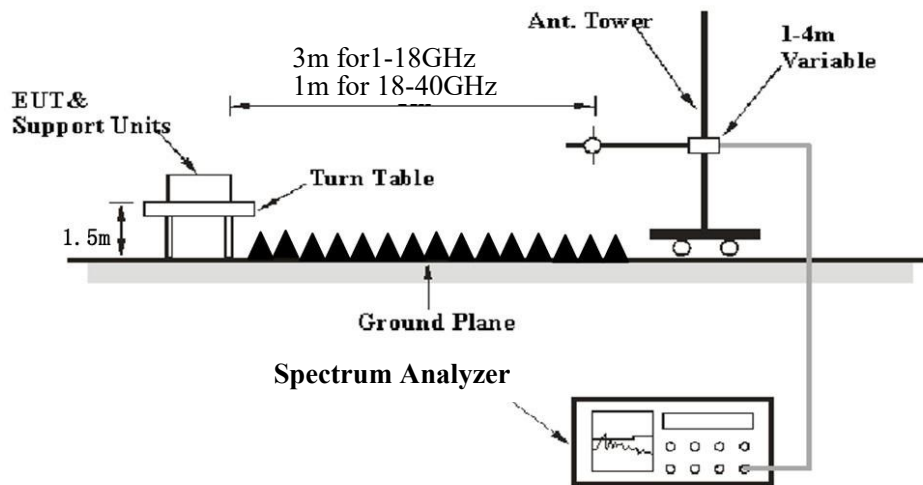
- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (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 $20 \cdot \log(1/3) = -9.5$ 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:

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

Test Data

Environmental Conditions

Temperature:	22~26.5 °C
Relative Humidity:	52~53 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2023-07-18 for below 1GHz and Jimi Zheng on 2023-07-20 for above 1GHz.

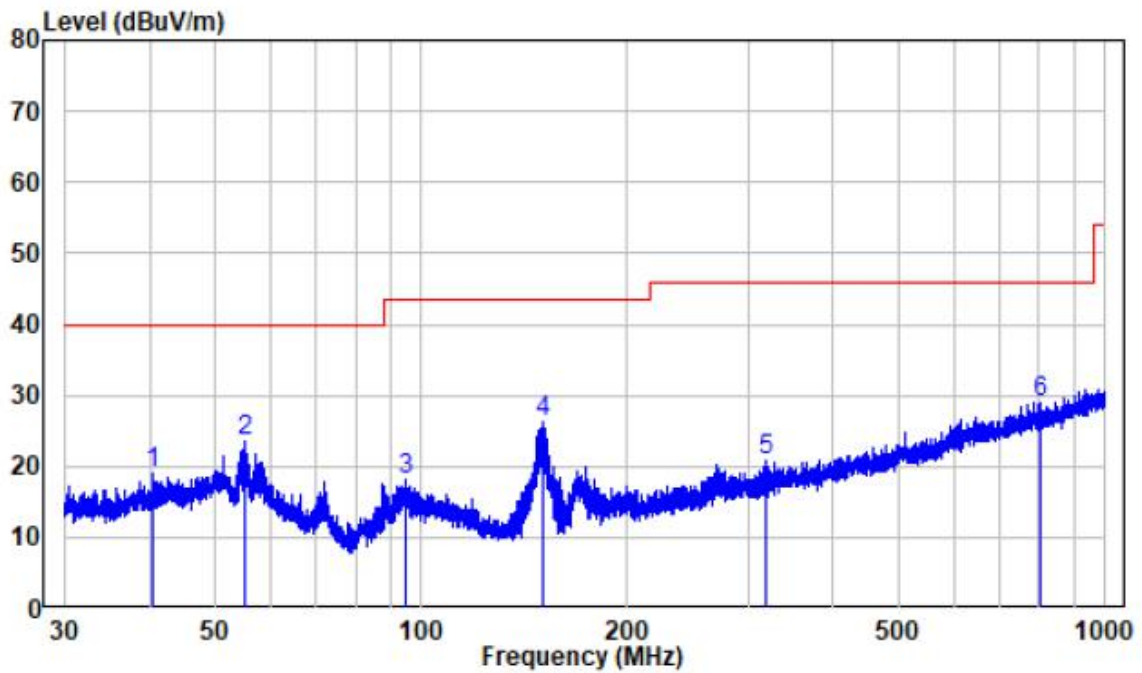
EUT operation mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case of X-axis orientation was recorded)

30 MHz – 1 GHz: (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.

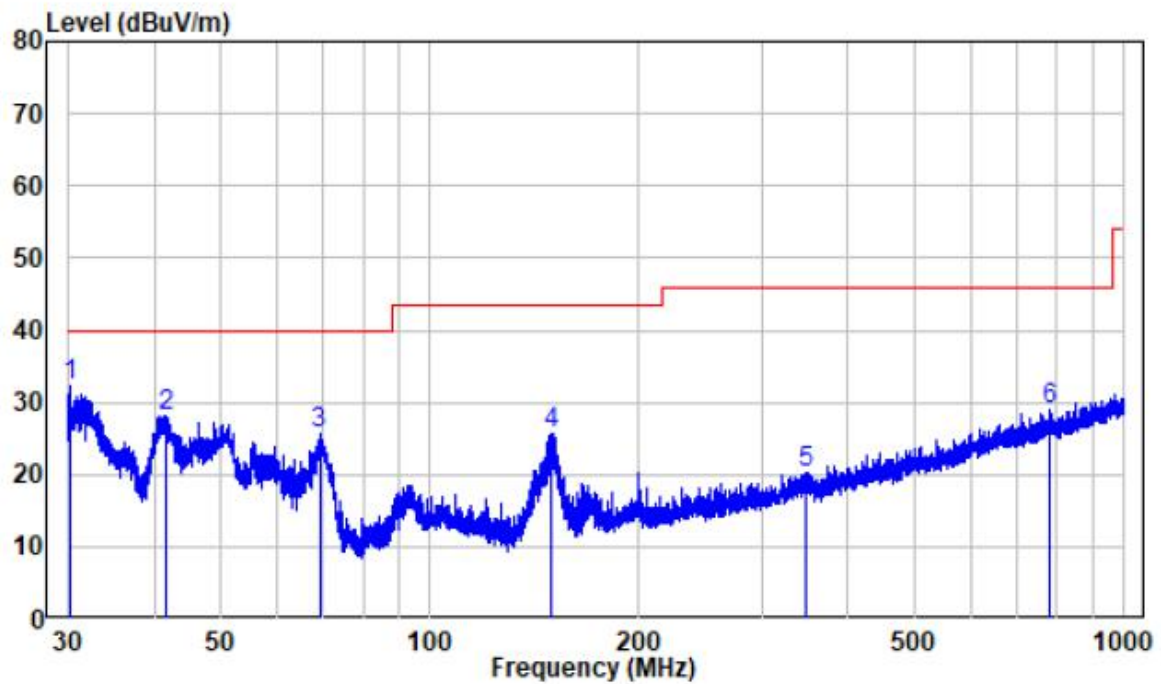
Adapter 1:

Horizontal



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	40.346	-10.29	29.20	18.91	40.00	-21.09	Peak
2	55.003	-10.28	33.86	23.58	40.00	-16.42	Peak
3	95.010	-12.48	30.70	18.22	43.50	-25.28	Peak
4	150.274	-15.26	41.49	26.23	43.50	-17.27	Peak
5	318.677	-8.52	29.49	20.97	46.00	-25.03	Peak
6	801.084	-0.36	29.32	28.96	46.00	-17.04	Peak

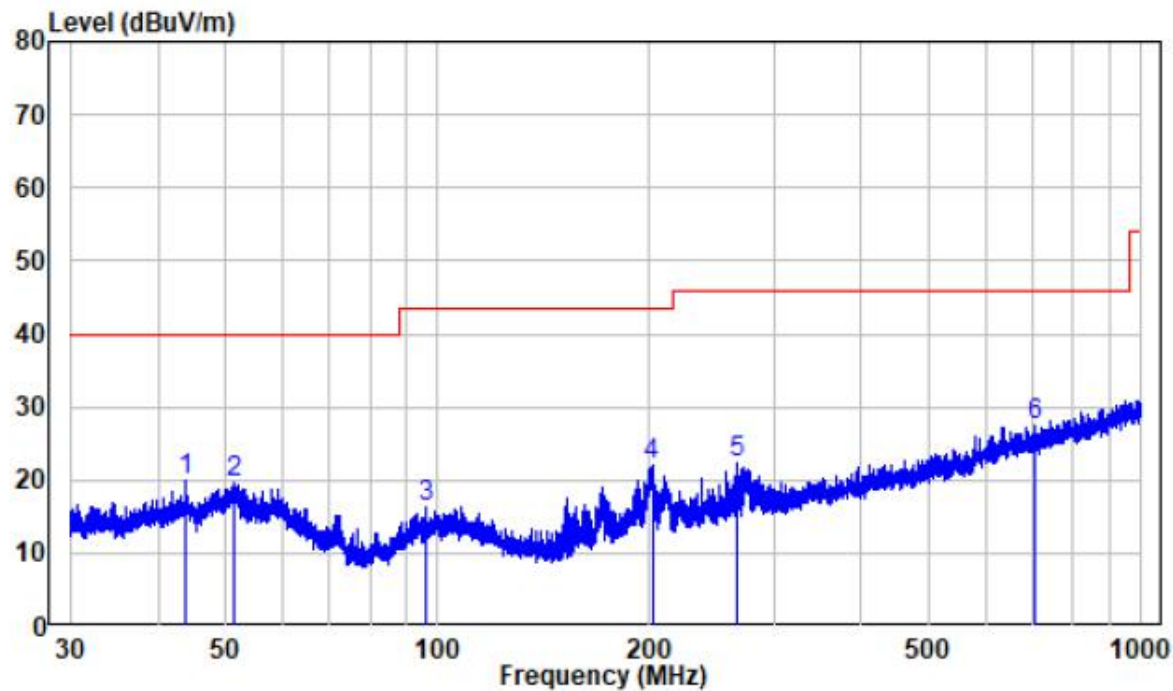
Vertical



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	30.251	-12.37	44.62	32.25	40.00	-7.75	Peak
2	41.676	-10.08	38.30	28.22	40.00	-11.78	Peak
3	69.235	-14.43	40.18	25.75	40.00	-14.25	Peak
4	149.159	-15.32	40.95	25.63	43.50	-17.87	Peak
5	347.266	-7.27	27.51	20.24	46.00	-25.76	Peak
6	783.375	0.01	28.90	28.91	46.00	-17.09	Peak

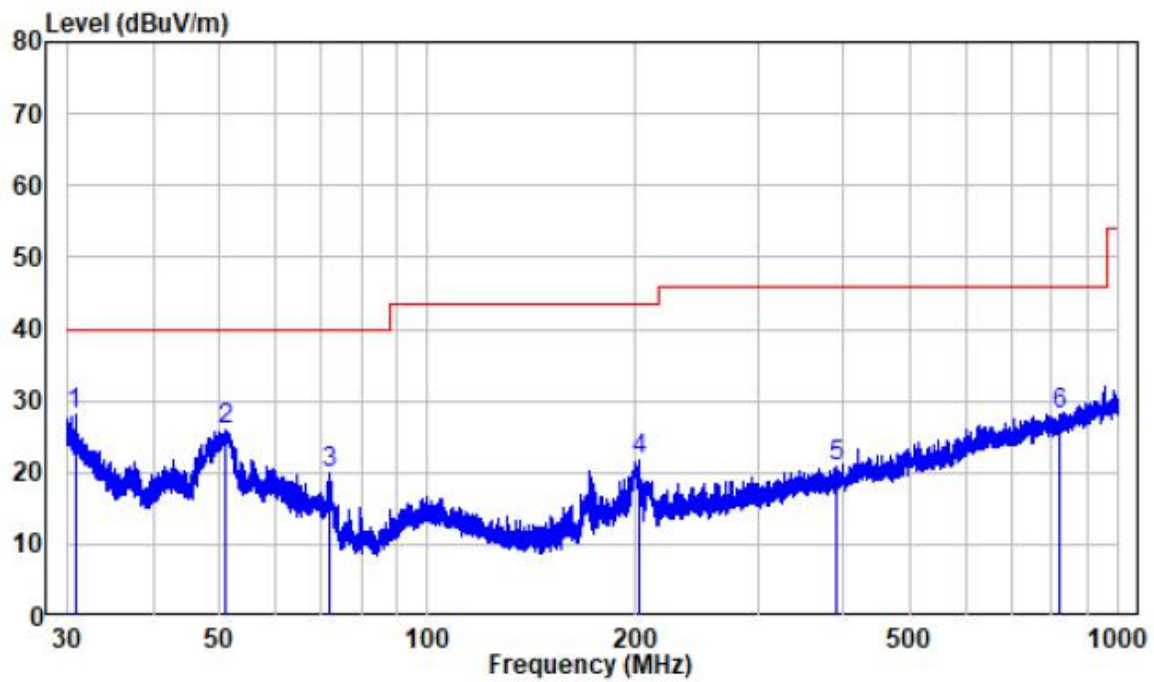
Adapter 2:

Horizontal



	Freq Factor		Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	43.850	-9.91	29.75	19.84	40.00	-20.16	Peak
2	51.481	-9.95	29.72	19.77	40.00	-20.23	Peak
3	96.478	-12.30	28.69	16.39	43.50	-27.11	Peak
4	201.570	-11.54	33.60	22.06	43.50	-21.44	Peak
5	265.909	-10.41	32.86	22.45	46.00	-23.55	Peak
6	704.844	-1.46	29.05	27.59	46.00	-18.41	Peak

Vertical



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	30.840	-12.31	40.35	28.04	40.00	-11.96	Peak
2	50.897	-9.93	35.92	25.99	40.00	-14.01	Peak
3	71.990	-15.62	35.69	20.07	40.00	-19.93	Peak
4	201.746	-11.55	33.31	21.76	43.50	-21.74	Peak
5	391.065	-6.87	27.72	20.85	46.00	-25.15	Peak
6	823.513	0.05	28.05	28.10	46.00	-17.90	Peak

Above 1GHz: (worst case is adapter 2)**5150-5250 MHz:**

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11a									
5180 MHz									
4500	65.73	PK	15	1.6	H	-6.01	59.72	74	-14.28
4500	53.56	AV	15	1.6	H	-6.01	47.55	54	-6.45
4500	65.85	PK	274	1.5	V	-6.01	59.84	74	-14.16
4500	53.68	AV	274	1.5	V	-6.01	47.67	54	-6.33
5150	68.02	PK	144	1.8	H	-4.29	63.73	74	-10.27
5150	54.53	AV	144	1.8	H	-4.29	50.24	54	-3.76
5150	68.14	PK	309	1.9	V	-4.29	63.85	74	-10.15
5150	54.65	AV	309	1.9	V	-4.29	50.36	54	-3.64
10360	58.33	PK	133	1.9	H	6.04	64.37	68.2	-3.83
10360	58.92	PK	330	1.9	V	6.04	64.96	68.2	-3.24
5200 MHz									
10400	57.75	PK	353	1.4	H	6.30	64.05	68.2	-4.15
10400	58.32	PK	102	1.4	V	6.30	64.62	68.2	-3.58
5240 MHz									
5350	64.44	PK	240	1.5	H	-3.15	61.29	74	-12.71
5350	49.95	AV	240	1.5	H	-3.15	46.80	54	-7.20
5350	64.56	PK	333	1.7	V	-3.15	61.41	74	-12.59
5350	50.07	AV	333	1.7	V	-3.15	46.92	54	-7.08
5460	61.48	PK	259	2	H	-2.38	59.10	74	-14.90
5460	48.35	AV	259	2	H	-2.38	45.97	54	-8.03
5460	61.59	PK	246	2	V	-2.38	59.21	74	-14.79
5460	48.47	AV	246	2	V	-2.38	46.09	54	-7.91
10480	57.86	PK	85	1	H	6.00	63.86	68.2	-4.34
10480	58.41	PK	284	1	V	6.00	64.41	68.2	-3.79

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac20									
5180 MHz									
4500	65.89	PK	69	1.4	H	-6.01	59.88	74	-14.12
4500	53.71	AV	69	1.4	H	-6.01	47.70	54	-6.30
4500	66.00	PK	107	2.1	V	-6.01	59.99	74	-14.01
4500	53.82	AV	107	2.1	V	-6.01	47.81	54	-6.19
5150	68.26	PK	301	1.8	H	-4.29	63.97	74	-10.03
5150	54.70	AV	301	1.8	H	-4.29	50.41	54	-3.59
5150	68.37	PK	331	1.6	V	-4.29	64.08	74	-9.92
5150	54.81	AV	331	1.6	V	-4.29	50.52	54	-3.48
10360	58.24	PK	288	1.1	H	6.04	64.28	68.2	-3.92
10360	58.78	PK	199	1.1	V	6.04	64.82	68.2	-3.38
5200MHz									
10400	57.66	PK	76	1	H	6.30	63.96	68.2	-4.24
10400	58.21	PK	233	1	V	6.30	64.51	68.2	-3.69
5240 MHz									
5350	64.62	PK	279	2.4	H	-3.15	61.47	74	-12.53
5350	50.07	AV	279	2.4	H	-3.15	46.92	54	-7.08
5350	64.74	PK	102	2.2	V	-3.15	61.59	74	-12.41
5350	50.18	AV	102	2.2	V	-3.15	47.03	54	-6.97
5460	61.68	PK	270	1.6	H	-2.38	59.30	74	-14.70
5460	48.53	AV	270	1.6	H	-2.38	46.15	54	-7.85
5460	61.80	PK	116	2.1	V	-2.38	59.42	74	-14.58
5460	48.64	AV	116	2.1	V	-2.38	46.26	54	-7.74
10480	57.75	PK	265	1.1	H	6.00	63.75	68.2	-4.45
10480	58.32	PK	265	1.1	V	6.00	64.32	68.2	-3.88

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac40									
5190 MHz									
4500	66.20	PK	257	1.1	H	-6.01	60.19	74	-13.81
4500	54.07	AV	257	1.1	H	-6.01	48.06	54	-5.94
4500	66.32	PK	166	2.3	V	-6.01	60.31	74	-13.69
4500	54.18	AV	166	2.3	V	-6.01	48.17	54	-5.83
5150	68.56	PK	179	2.4	H	-4.29	64.27	74	-9.73
5150	54.92	AV	179	2.4	H	-4.29	50.63	54	-3.37
5150	68.68	PK	144	2.3	V	-4.29	64.39	74	-9.61
5150	55.04	AV	144	2.3	V	-4.29	50.75	54	-3.25
10380	57.78	PK	57	1.3	H	6.17	63.95	68.2	-4.25
10380	58.27	PK	255	1.3	V	6.17	64.44	68.2	-3.76
5230 MHz									
5350	65.04	PK	153	2.1	H	-3.15	61.89	74	-12.11
5350	50.55	AV	153	2.1	H	-3.15	47.40	54	-6.60
5350	65.16	PK	348	1.5	V	-3.15	62.01	74	-11.99
5350	50.67	AV	348	1.5	V	-3.15	47.52	54	-6.48
5460	62.09	PK	127	1.6	H	-2.38	59.71	74	-14.29
5460	48.97	AV	127	1.6	H	-2.38	46.59	54	-7.41
5460	62.20	PK	26	2.3	V	-2.38	59.82	74	-14.18
5460	49.08	AV	26	2.3	V	-2.38	46.70	54	-7.30
10460	57.84	PK	34	1.2	H	5.91	63.75	68.2	-4.45
10460	58.33	PK	3	1.2	V	5.91	64.24	68.2	-3.96

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac80									
5210MHz									
4500	66.40	PK	261	1.3	H	-6.01	60.39	74	-13.61
4500	54.21	AV	261	1.3	H	-6.01	48.20	54	-5.80
4500	66.52	PK	23	2.2	V	-6.01	60.51	74	-13.49
4500	54.33	AV	23	2.2	V	-6.01	48.32	54	-5.68
5150	68.90	PK	133	2.3	H	-4.29	64.61	74	-9.39
5150	55.16	AV	133	2.3	H	-4.29	50.87	54	-3.13
5150	69.02	PK	154	1.6	V	-4.29	64.73	74	-9.27
5150	55.28	AV	154	1.6	V	-4.29	50.99	54	-3.01
5350	65.36	PK	68	2.3	H	-3.15	62.21	74	-11.79
5350	51.49	AV	68	2.3	H	-3.15	48.34	54	-5.66
5350	65.47	PK	329	1.1	V	-3.15	62.32	74	-11.68
5350	51.60	AV	329	1.1	V	-3.15	48.45	54	-5.55
5460	62.20	PK	95	1.1	H	-2.38	59.82	74	-14.18
5460	49.82	AV	95	1.1	H	-2.38	47.44	54	-6.56
5460	62.31	PK	189	1.2	V	-2.38	59.93	74	-14.07
5460	49.93	AV	189	1.2	V	-2.38	47.55	54	-6.45
10420	56.86	PK	223	1.2	H	6.12	62.98	68.2	-5.22
10420	57.37	PK	25	1.2	V	6.12	63.49	68.2	-4.71

5725-5850 MHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11a									
5745 MHz									
5650	64.46	PK	122	1.3	H	-2.80	61.66	68.2	-6.54
5700	64.11	PK	273	1.1	H	-1.62	62.49	105.2	-42.71
5720	67.65	PK	133	1.4	H	-1.95	65.70	110.8	-45.10
5725	70.51	PK	234	1.4	H	-2.03	68.48	122.2	-53.72
5650	64.59	PK	18	1.7	V	-2.80	61.79	68.2	-6.41
5700	64.56	PK	188	2.1	V	-1.62	62.94	105.2	-42.26
5720	68.16	PK	211	1.1	V	-1.95	66.21	110.8	-44.59
5725	71.36	PK	251	1.4	V	-2.03	69.33	122.2	-52.87
11490	53.34	PK	97	1.3	H	7.99	61.33	74	-12.67
11490	39.57	AV	173	1.3	H	7.99	47.56	54	-6.44
11490	53.61	PK	183	1.4	V	7.99	61.60	74	-12.40
11490	39.82	AV	74	1.4	V	7.99	47.81	54	-6.19
5785 MHz									
11570	53.47	PK	93	2.2	H	7.69	61.16	74	-12.84
11570	39.91	AV	306	2.2	H	7.69	47.60	54	-6.40
11570	53.74	PK	157	1.6	V	7.69	61.43	74	-12.57
11570	40.13	AV	137	1.6	V	7.69	47.82	54	-6.18
5825 MHz									
5850	67.50	PK	349	2.3	H	-0.60	66.90	122.2	-55.30
5855	66.43	PK	269	1.3	H	-0.50	65.93	110.8	-44.87
5875	64.87	PK	277	2	H	-0.09	64.78	105.2	-40.42
5925	63.28	PK	68	1.7	H	-0.12	63.16	68.2	-5.04
5850	67.97	PK	202	2	V	-0.60	67.37	122.2	-54.83
5855	66.76	PK	57	2.1	V	-0.50	66.26	110.8	-44.54
5875	65.27	PK	189	1.9	V	-0.09	65.18	105.2	-40.02
5925	63.41	PK	235	2	V	-0.12	63.29	68.2	-4.91
11650	53.76	PK	283	1.7	H	6.82	60.58	74	-13.42
11650	40.30	AV	100	1.7	H	6.82	47.12	54	-6.88
11650	54.01	PK	191	1.3	V	6.82	60.83	74	-13.17
11650	40.49	AV	172	1.3	V	6.82	47.31	54	-6.69

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac20									
5745 MHz									
5650	64.78	PK	334	1.6	H	-2.80	61.98	68.2	-6.22
5700	64.71	PK	339	1.2	H	-1.62	63.09	105.2	-42.11
5720	67.98	PK	93	2.4	H	-1.95	66.03	110.8	-44.77
5725	71.95	PK	4	2.1	H	-2.03	69.92	122.2	-52.28
5650	64.91	PK	164	2.4	V	-2.80	62.11	68.2	-6.09
5700	65.02	PK	189	1.5	V	-1.62	63.40	105.2	-41.80
5720	68.57	PK	277	1.1	V	-1.95	66.62	110.8	-44.18
5725	73.02	PK	76	1.3	V	-2.03	70.99	122.2	-51.21
11490	53.21	PK	48	1	H	7.99	61.20	74	-12.80
11490	39.44	AV	136	1	H	7.99	47.43	54	-6.57
11490	53.49	PK	27	1.4	V	7.99	61.48	74	-12.52
11490	39.68	AV	88	1.4	V	7.99	47.67	54	-6.33
5785 MHz									
11570	53.35	PK	269	1.3	H	7.69	61.04	74	-12.96
11570	39.76	AV	332	1.3	H	7.69	47.45	54	-6.55
11570	53.54	PK	273	1.6	V	7.69	61.23	74	-12.77
11570	39.98	AV	290	1.6	V	7.69	47.67	54	-6.33
5825 MHz									
5850	68.54	PK	9	2.2	H	-0.60	67.94	122.2	-54.26
5855	67.17	PK	63	1.1	H	-0.50	66.67	110.8	-44.13
5875	65.92	PK	92	1.2	H	-0.09	65.83	105.2	-39.37
5925	63.54	PK	105	1.6	H	-0.12	63.42	68.2	-4.78
5850	69.28	PK	149	1.2	V	-0.60	68.68	122.2	-53.52
5855	67.79	PK	99	1.6	V	-0.50	67.29	110.8	-43.51
5875	66.35	PK	177	1.3	V	-0.09	66.26	105.2	-38.94
5925	63.67	PK	38	1.3	V	-0.12	63.55	68.2	-4.65
11650	53.62	PK	317	1.7	H	6.82	60.44	74	-13.56
11650	40.17	AV	180	1.7	H	6.82	46.99	54	-7.01
11650	53.89	PK	264	1.1	V	6.82	60.71	74	-13.29
11650	40.40	AV	270	1.1	V	6.82	47.22	54	-6.78

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac40									
5755 MHz									
5650	65.16	PK	270	1.4	H	-2.80	62.36	68.2	-5.84
5700	65.83	PK	123	1.1	H	-1.62	64.21	105.2	-40.99
5720	68.34	PK	153	1.3	H	-1.95	66.39	110.8	-44.41
5725	70.95	PK	153	1.3	H	-2.03	68.92	122.2	-53.28
5650	65.29	PK	211	1.6	V	-2.80	62.49	68.2	-5.71
5700	66.32	PK	194	2.2	V	-1.62	64.70	105.2	-40.50
5720	69.28	PK	359	1.7	V	-1.95	67.33	110.8	-43.47
5725	71.77	PK	234	1.8	V	-2.03	69.74	122.2	-52.46
11510	52.76	PK	177	1	H	8.04	60.80	74	-13.20
11510	39.97	AV	17	1	H	8.04	48.01	54	-5.99
11510	53.01	PK	141	2.1	V	8.04	61.05	74	-12.95
11510	40.20	AV	356	2.1	V	8.04	48.24	54	-5.76
5795 MHz									
5850	66.60	PK	212	2.1	H	-0.60	66.00	122.2	-56.20
5855	65.55	PK	315	2.5	H	-0.50	65.05	110.8	-45.75
5875	64.32	PK	42	1.7	H	-0.09	64.23	105.2	-40.97
5925	63.74	PK	163	1.5	H	-0.12	63.62	68.2	-4.58
5850	66.95	PK	319	1.8	V	-0.60	66.35	122.2	-55.85
5855	65.99	PK	245	2	V	-0.50	65.49	110.8	-45.31
5875	64.75	PK	334	1.6	V	-0.09	64.66	105.2	-40.54
5925	63.86	PK	35	1.5	V	-0.12	63.74	68.2	-4.46
11590	53.18	PK	164	1.1	H	7.60	60.78	74	-13.22
11590	40.33	AV	31	1.1	H	7.60	47.93	54	-6.07
11590	53.40	PK	285	2.3	V	7.60	61.00	74	-13.00
11590	40.58	AV	50	2.3	V	7.60	48.18	54	-5.82

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ac80									
5775 MHz									
5650	65.44	PK	55	1.6	H	-2.80	62.64	68.2	-5.56
5700	67.03	PK	316	1.9	H	-1.62	65.41	105.2	-39.79
5720	69.24	PK	279	2.3	H	-1.95	67.29	110.8	-43.51
5725	71.01	PK	345	1.4	H	-2.03	68.98	122.2	-53.22
5650	65.59	PK	239	1.8	V	-2.80	62.79	68.2	-5.41
5700	67.60	PK	97	1.1	V	-1.62	65.98	105.2	-39.22
5720	69.95	PK	342	1.8	V	-1.95	68.00	110.8	-42.80
5725	71.65	PK	45	1.4	V	-2.03	69.62	122.2	-52.58
5850	69.19	PK	220	2.4	H	-0.60	68.59	122.2	-53.61
5855	67.40	PK	15	2.5	H	-0.50	66.90	110.8	-43.90
5875	65.25	PK	119	1.3	H	-0.09	65.16	105.2	-40.04
5925	64.15	PK	267	2.3	H	-0.12	64.03	68.2	-4.17
5850	69.73	PK	316	1.9	V	-0.60	69.13	122.2	-53.07
5855	68.00	PK	34	1.6	V	-0.50	67.50	110.8	-43.30
5875	65.87	PK	120	1.8	V	-0.09	65.78	105.2	-39.42
5925	64.27	PK	28	2.5	V	-0.12	64.15	68.2	-4.05
11550	53.77	PK	161	1.7	H	7.77	61.54	74	-12.46
11550	41.38	AV	37	1.7	H	7.77	49.15	54	-4.85
11550	54.00	PK	358	2.3	V	7.77	61.77	74	-12.23
11550	41.66	AV	161	2.3	V	7.77	49.43	54	-4.57

Note:

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

Corrected Amplitude = Corrected Factor + Reading

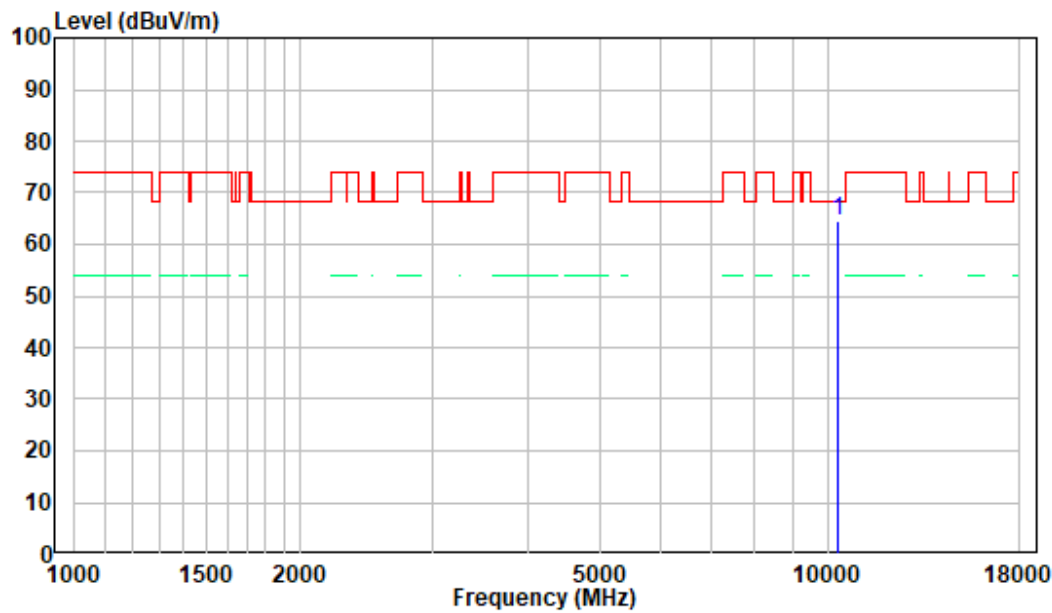
Margin = Corrected Amplitude - Limit

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

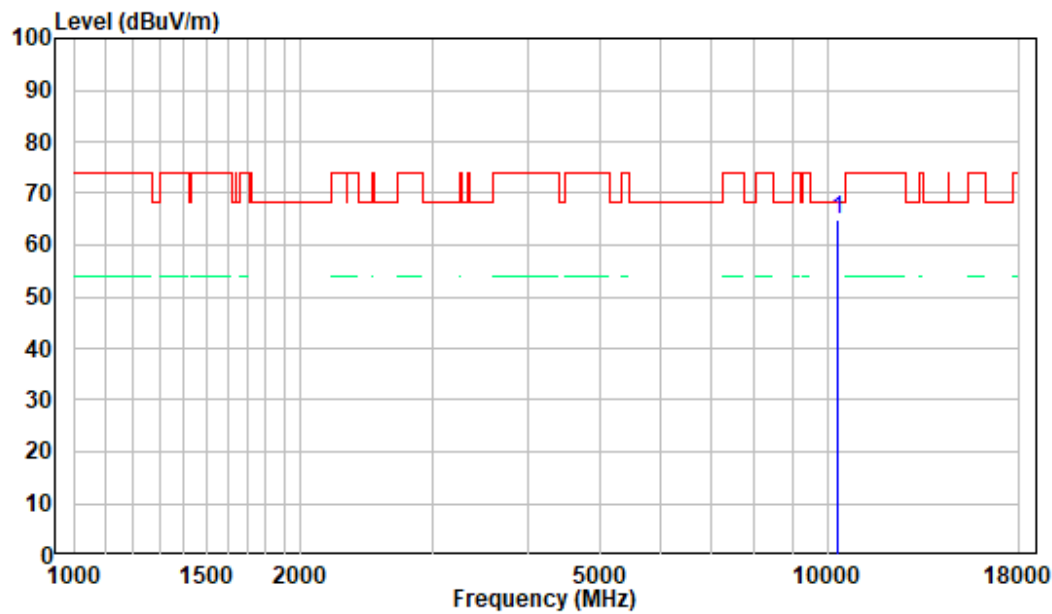
1 GHz - 18 GHz: (Pre-Scan plots)

802.11 a, 5180MHz

Horizontal

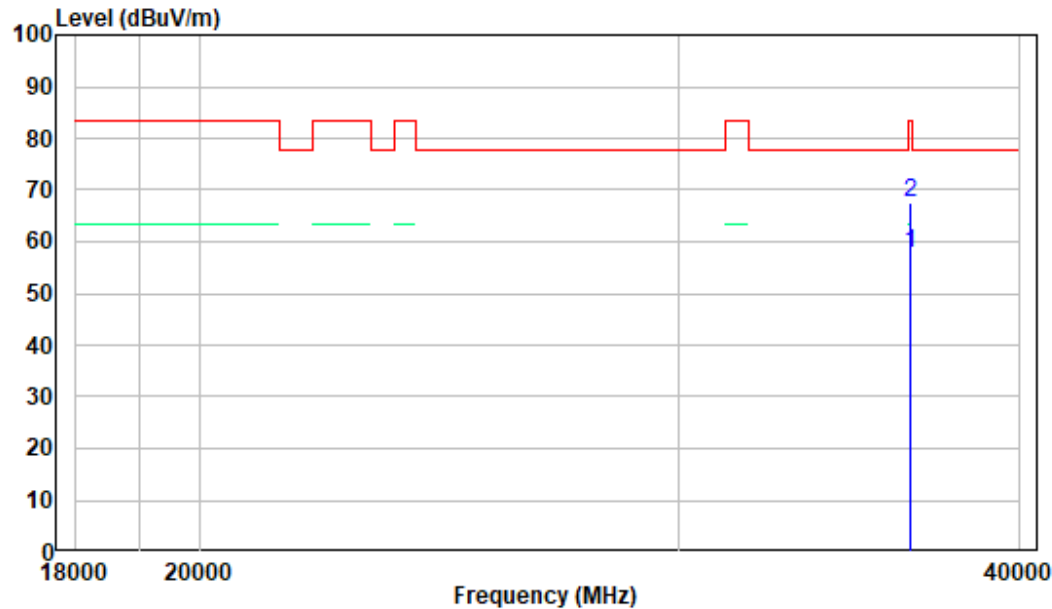


Vertical

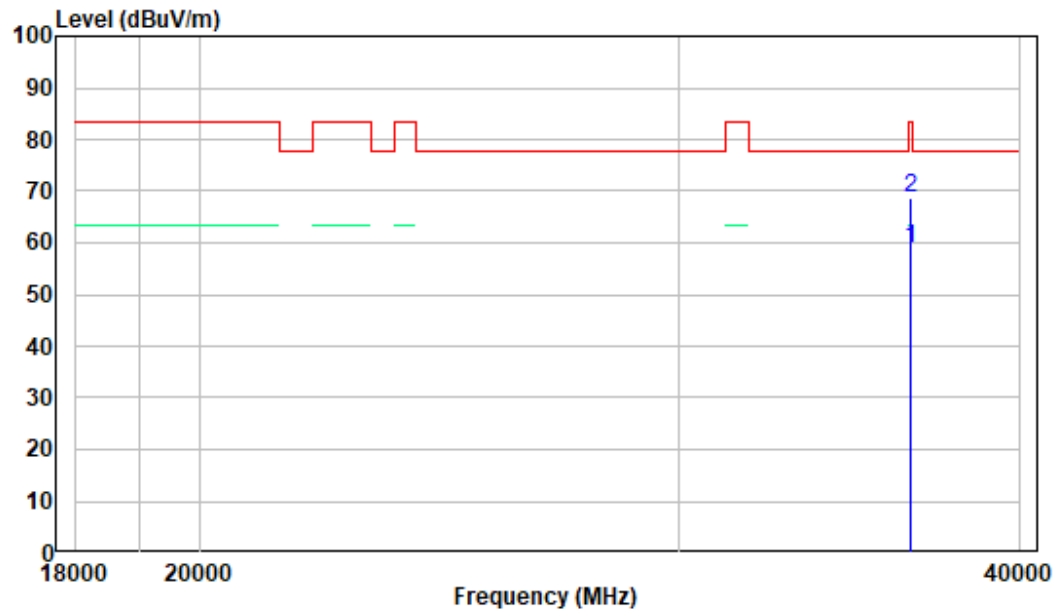


18-40GHz: (Pre-Scan plots)

802.11 a, 5180MHz
Horizontal

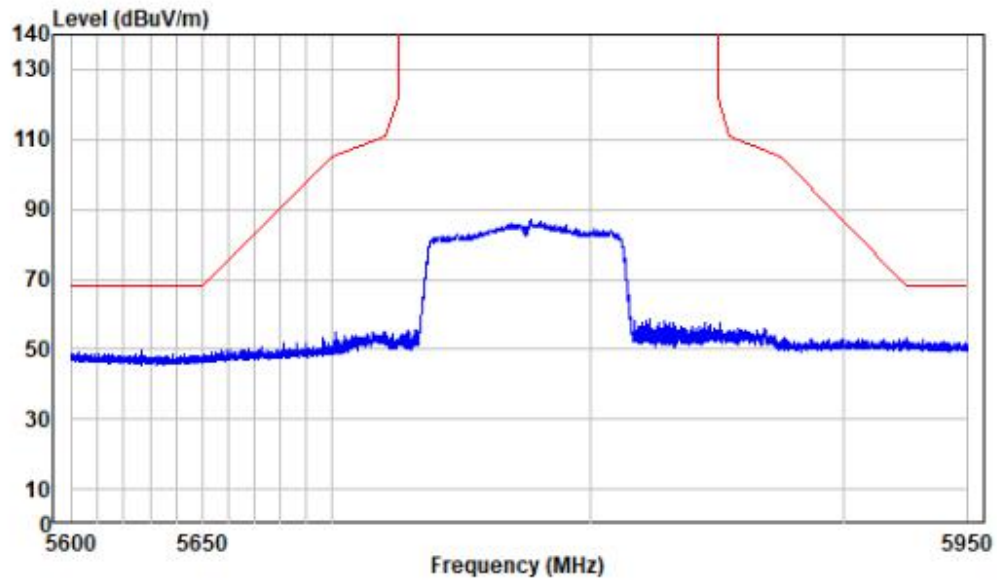


Vertical

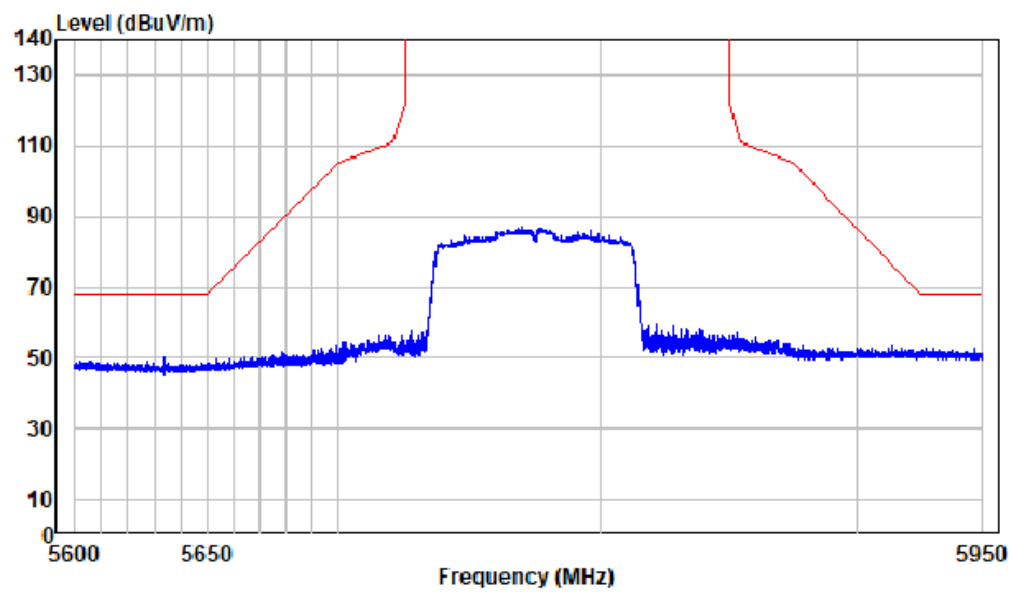


Band Edge (Worst Case: 802.11 ac80, 5775MHz)

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

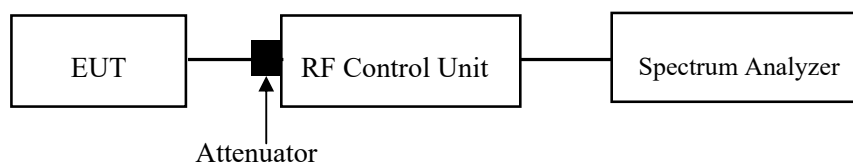
1. Emission Bandwidth (EBW)

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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:

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- 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:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Matt Liang on 2023-07-19.

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.

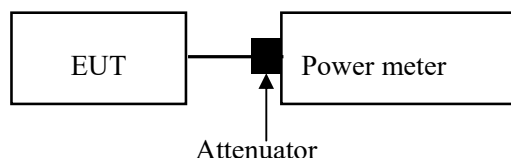
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not 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:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Matt Liang on 2023-07-19.

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.

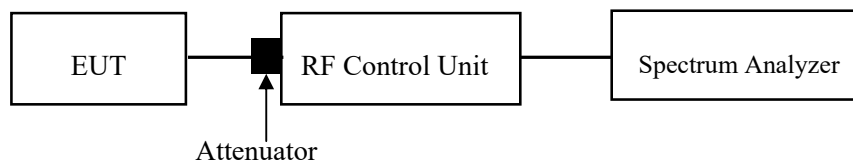
Test Procedure

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

- Set RBW=1MHz or 500 kHz. VBW>3 RBW
- If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log(500 \text{ kHz RBW})$ to the measured result. Whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log(1 \text{ MHz/RBW})$ to the measured result, whereas RBW (<1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement. f) Detector=power averaging(1ms)
- 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.

- 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:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Matt Liang on 2023-07-19.

EUT operation mode: Transmitting

Test Result: Pass

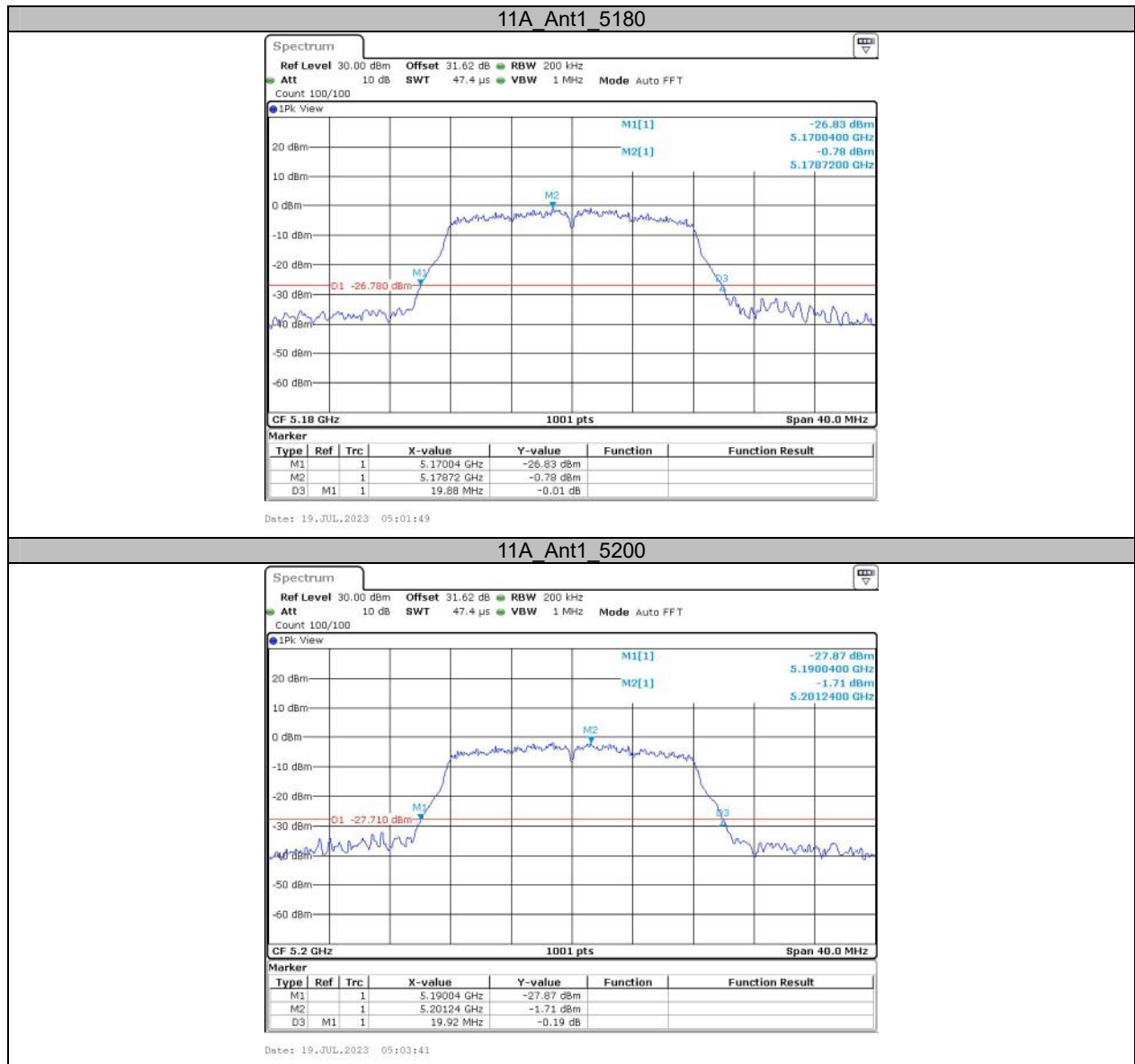
Please refer to the Appendix.

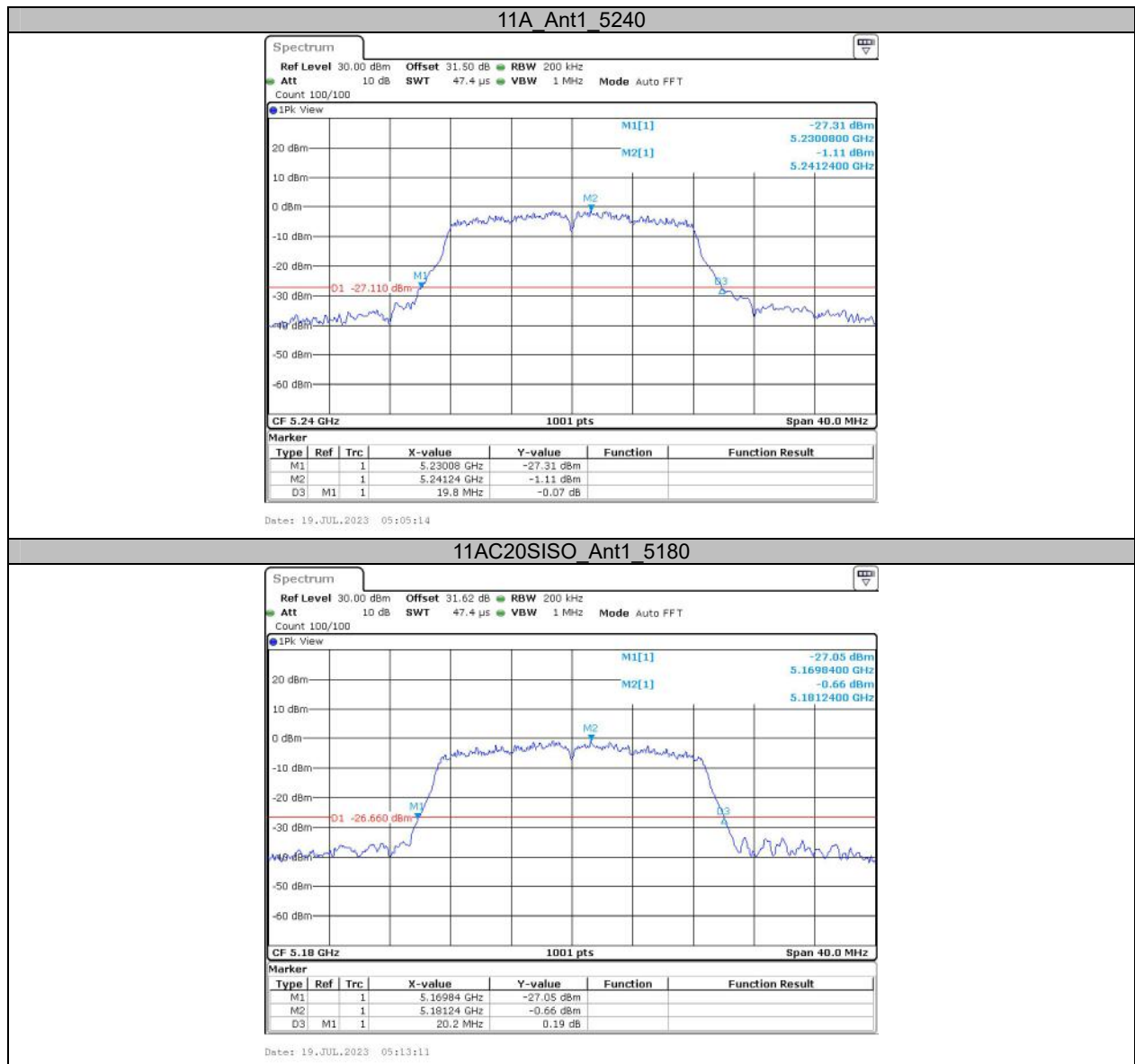
APPENDIX

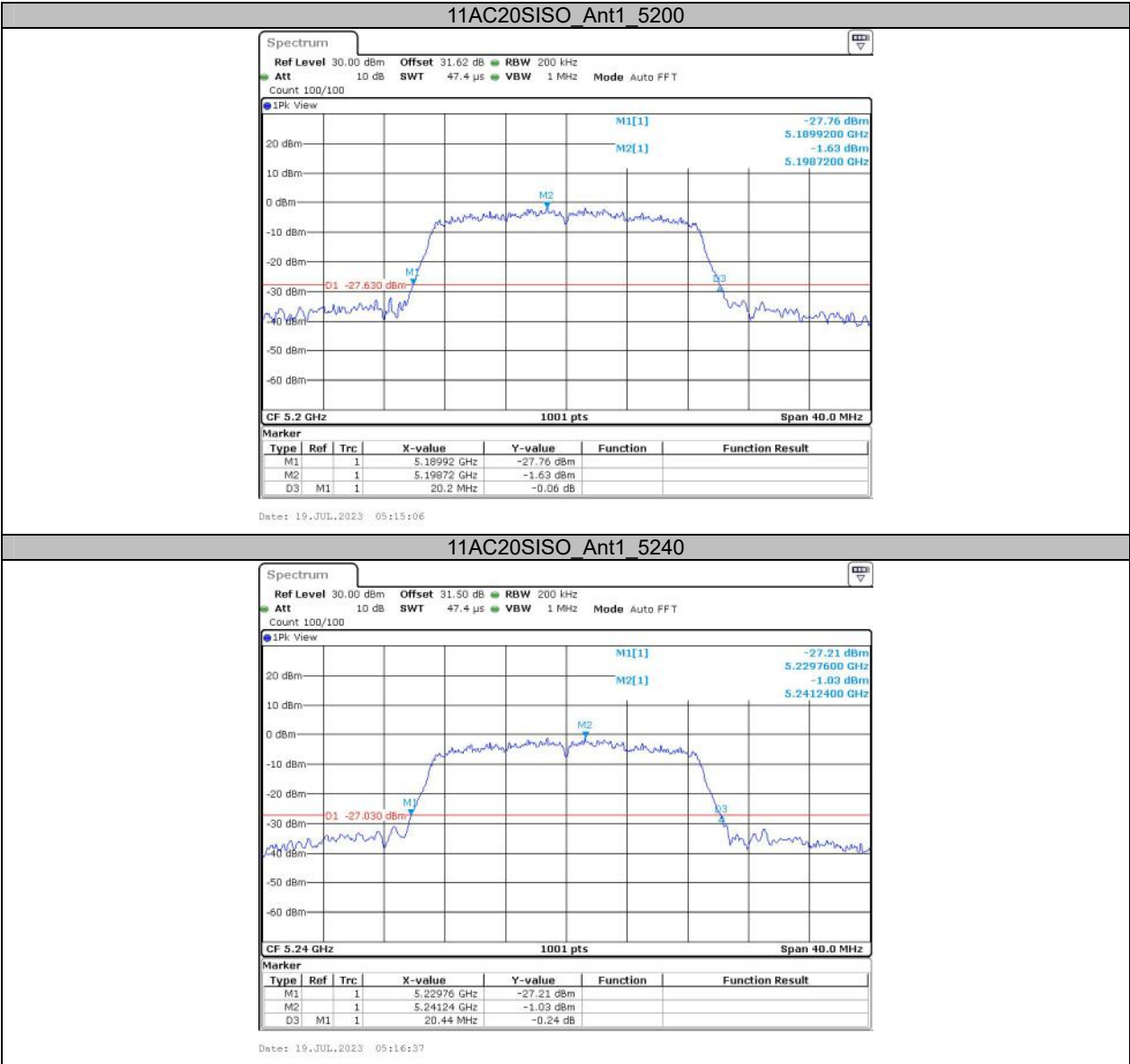
Appendix A1: Emission Bandwidth Test Result

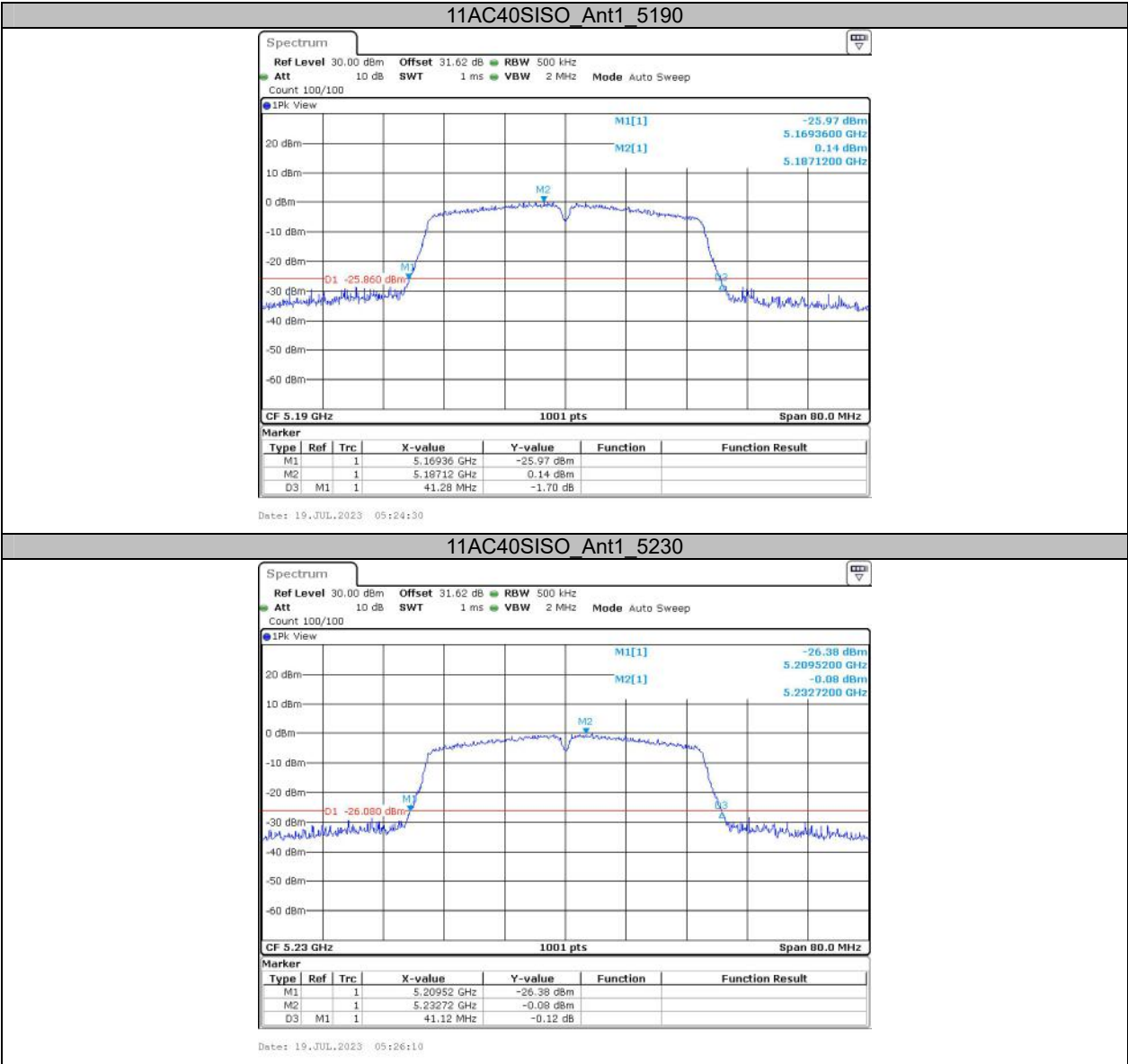
Test Mode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.88	5170.04	5189.92	---	---
		5200	19.92	5190.04	5209.96	---	---
		5240	19.80	5230.08	5249.88	---	---
11AC20SISO	Ant1	5180	20.20	5169.84	5190.04	---	---
		5200	20.20	5189.92	5210.12	---	---
		5240	20.44	5229.76	5250.20	---	---
11AC40SISO	Ant1	5190	41.28	5169.36	5210.64	---	---
		5230	41.12	5209.52	5250.64	---	---
11AC80SISO	Ant1	5210	81.76	5169.20	5250.96	---	---

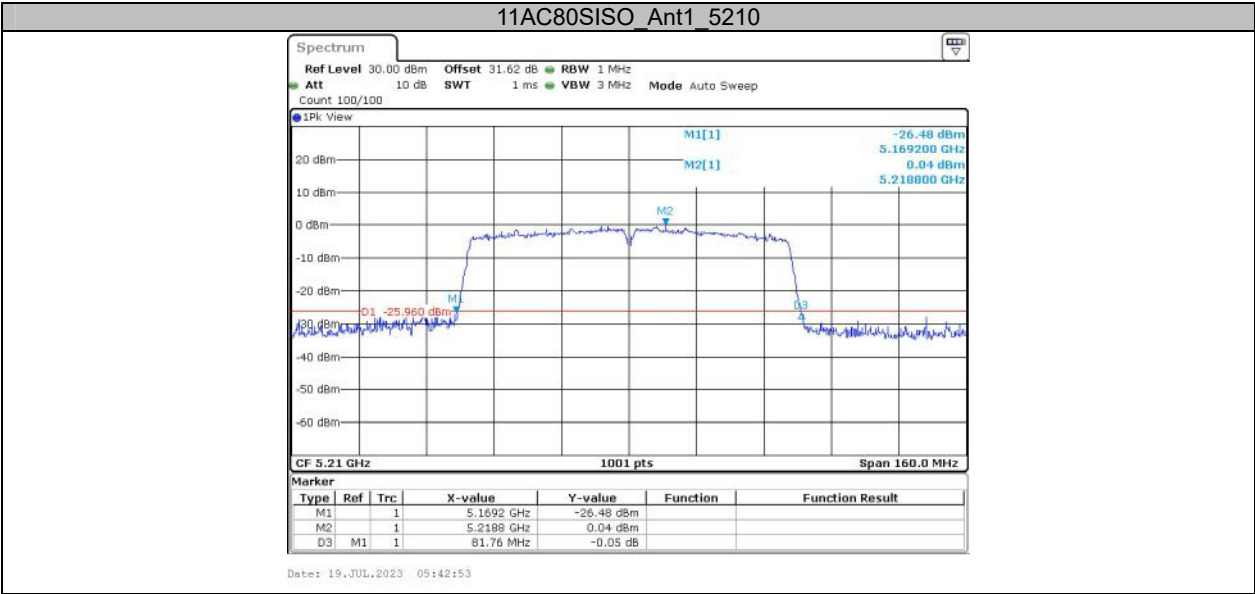
Test Graphs









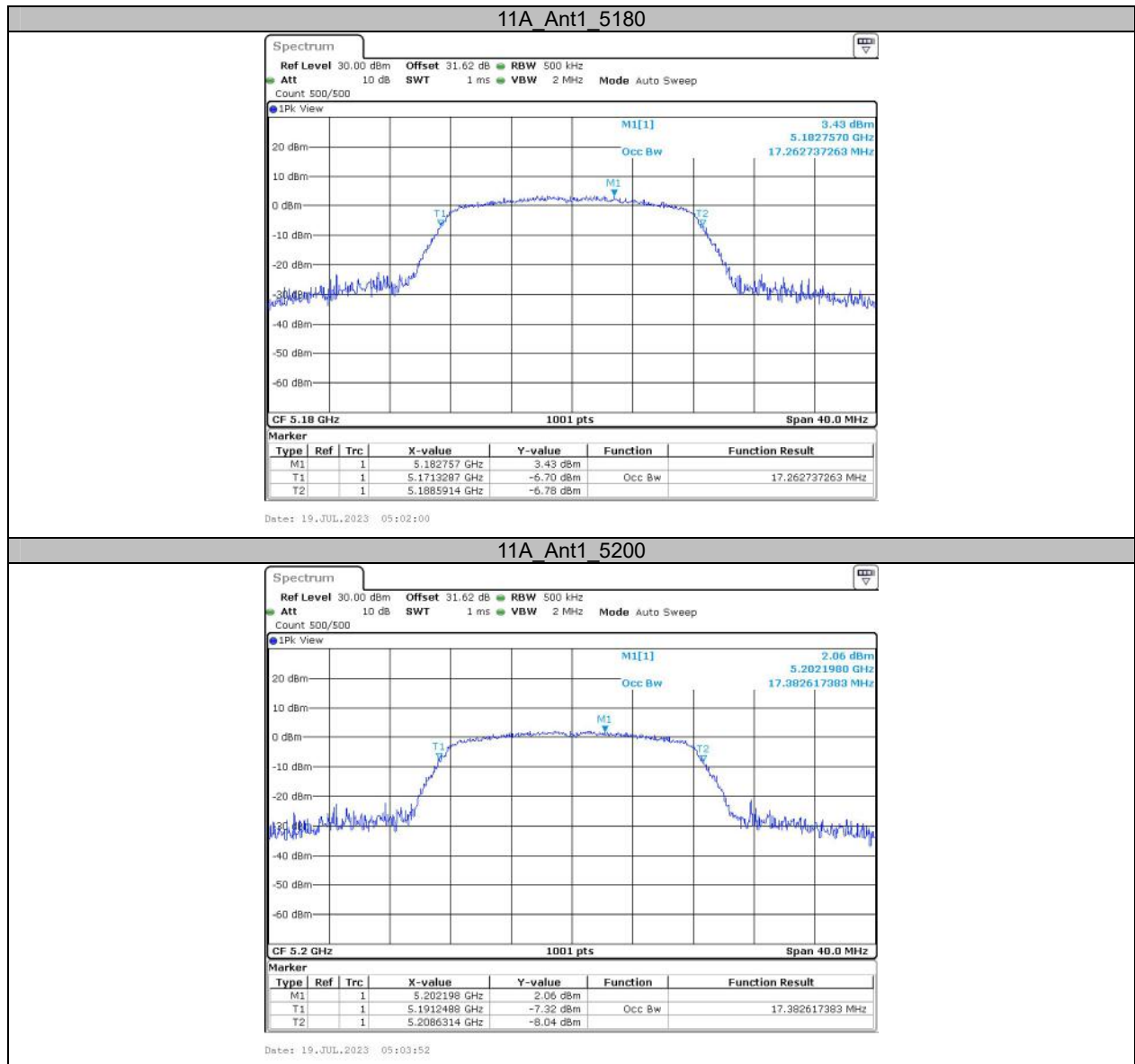


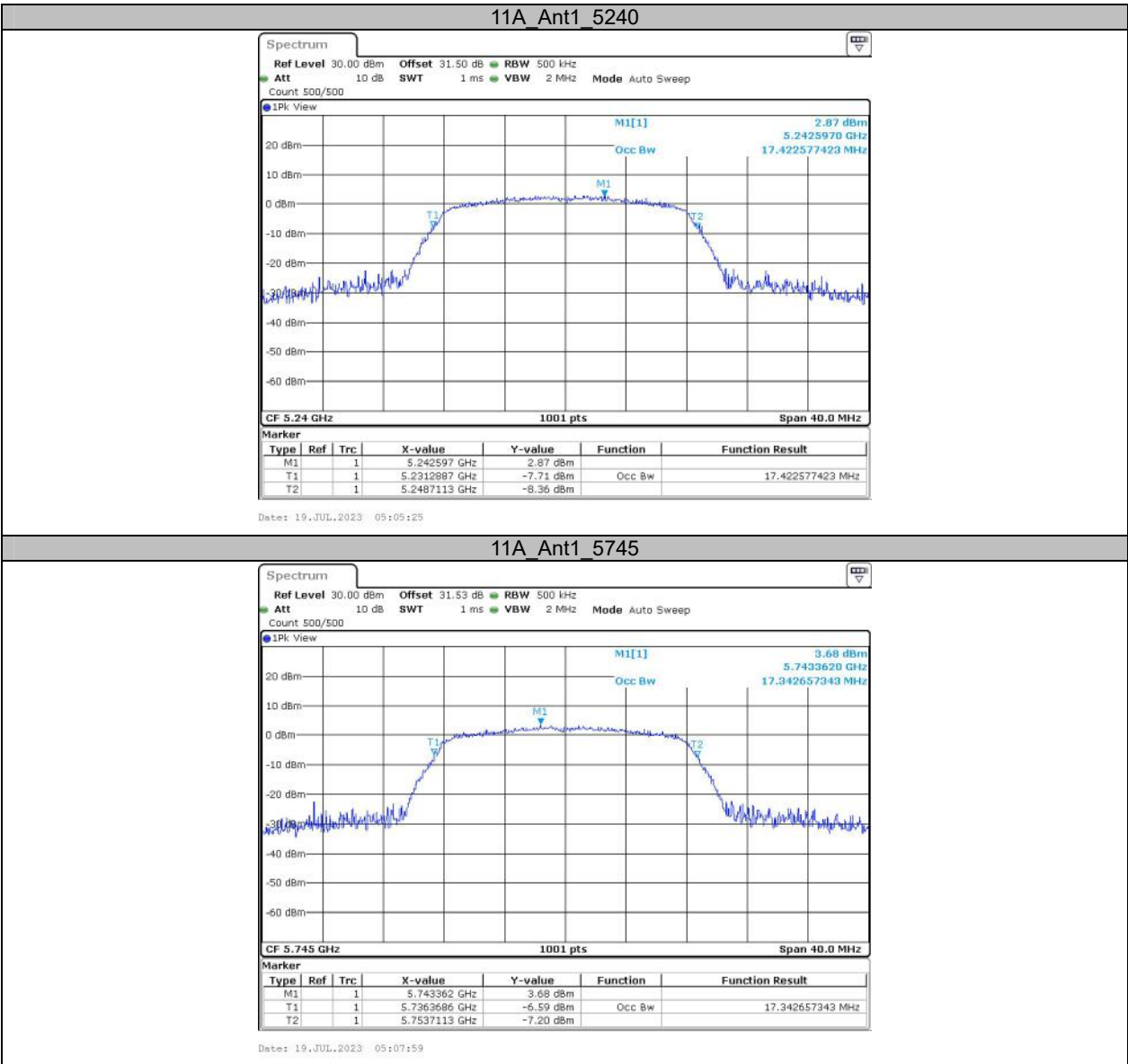
Appendix A2: Occupied channel bandwidth Test Result

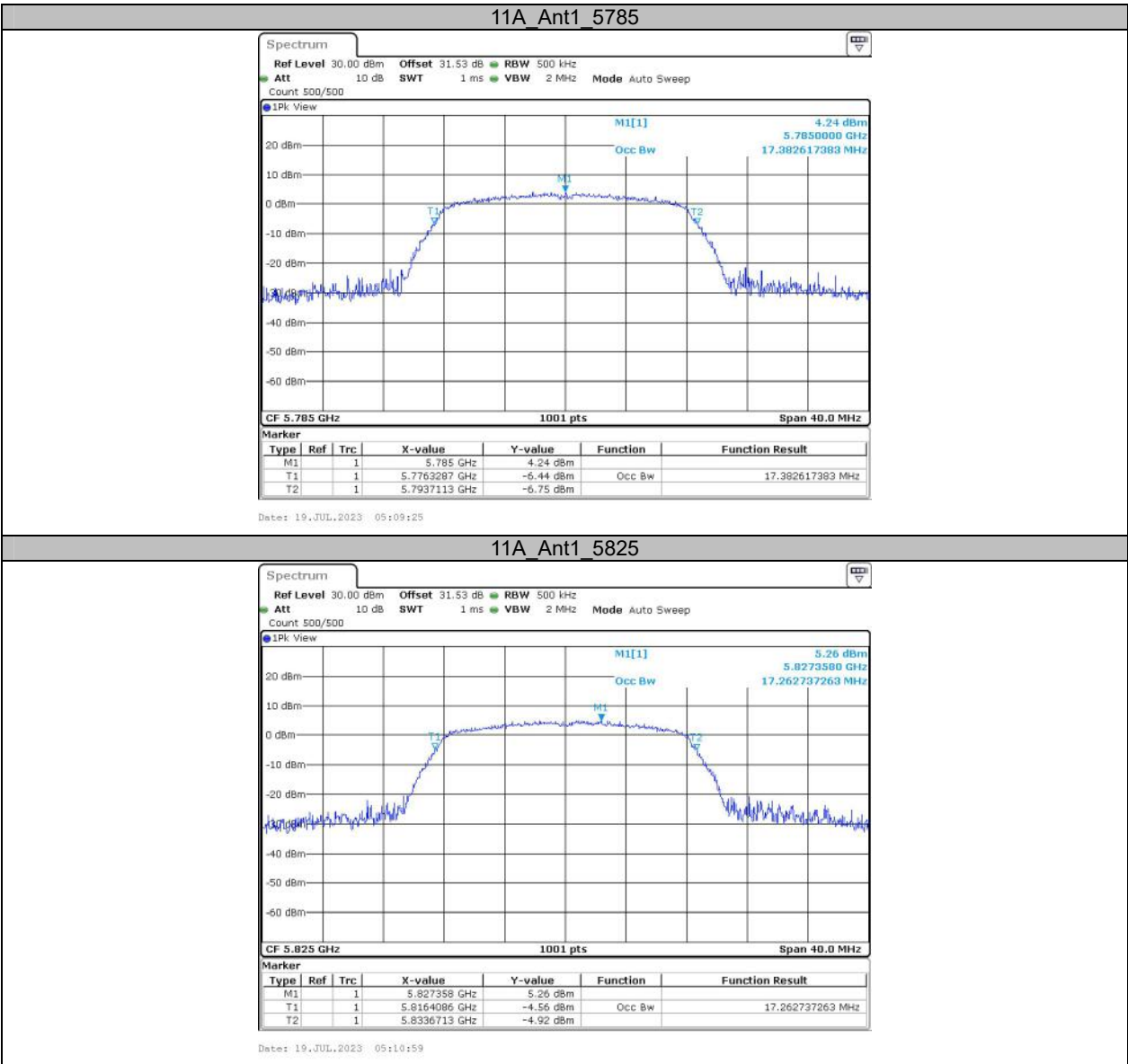
Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.263	5171.329	5188.591	---	---
		5200	17.383	5191.249	5208.631	---	---
		5240	17.423	5231.289	5248.711	---	---
		5745	17.343	5736.369	5753.711	---	---
		5785	17.383	5776.329	5793.711	---	---
		5825	17.263	5816.409	5833.671	---	---
11AC20SISO	Ant1	5180	18.102	5170.929	5189.031	---	---
		5200	18.182	5190.889	5209.071	---	---
		5240	18.182	5230.929	5249.111	---	---
		5745	18.142	5735.929	5754.071	---	---
		5785	18.142	5775.929	5794.071	---	---
		5825	18.142	5815.969	5834.111	---	---
11AC40SISO	Ant1	5190	36.603	5171.618	5208.222	---	---
		5230	36.603	5211.778	5248.382	---	---
		5755	36.763	5736.698	5773.462	---	---
		5795	36.523	5776.858	5813.382	---	---
11AC80SISO	Ant1	5210	75.764	5172.118	5247.882	---	---
		5775	75.445	5737.597	5813.042	---	---

Note: the device not operating any part of OBW fall within 5250-5350MHz and 5470-5725MHz range.

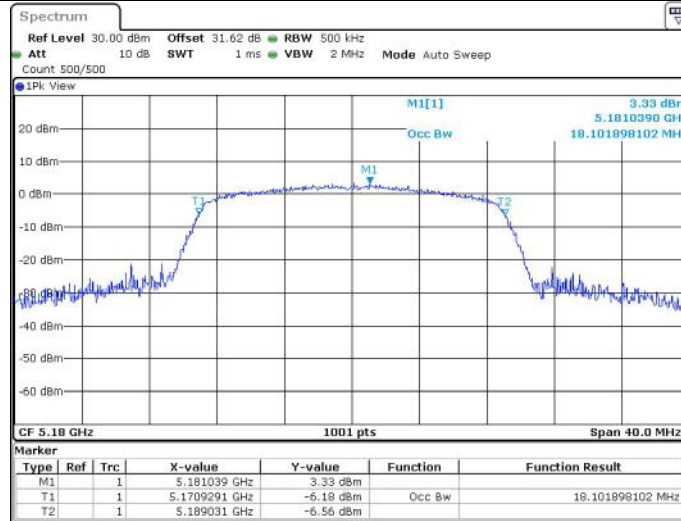
Test Graphs



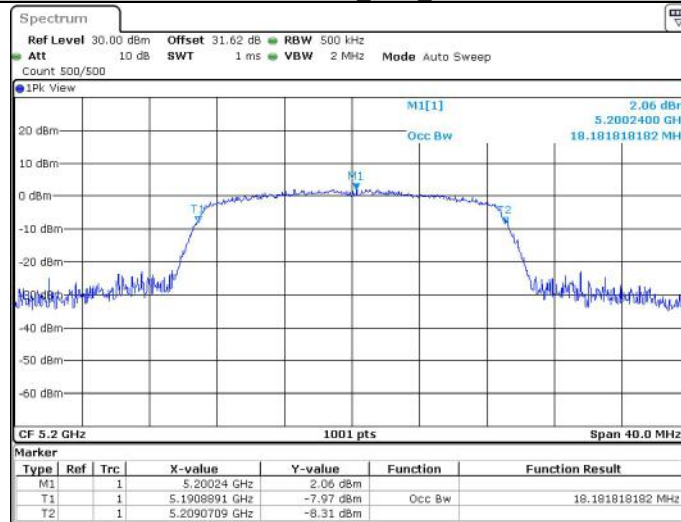


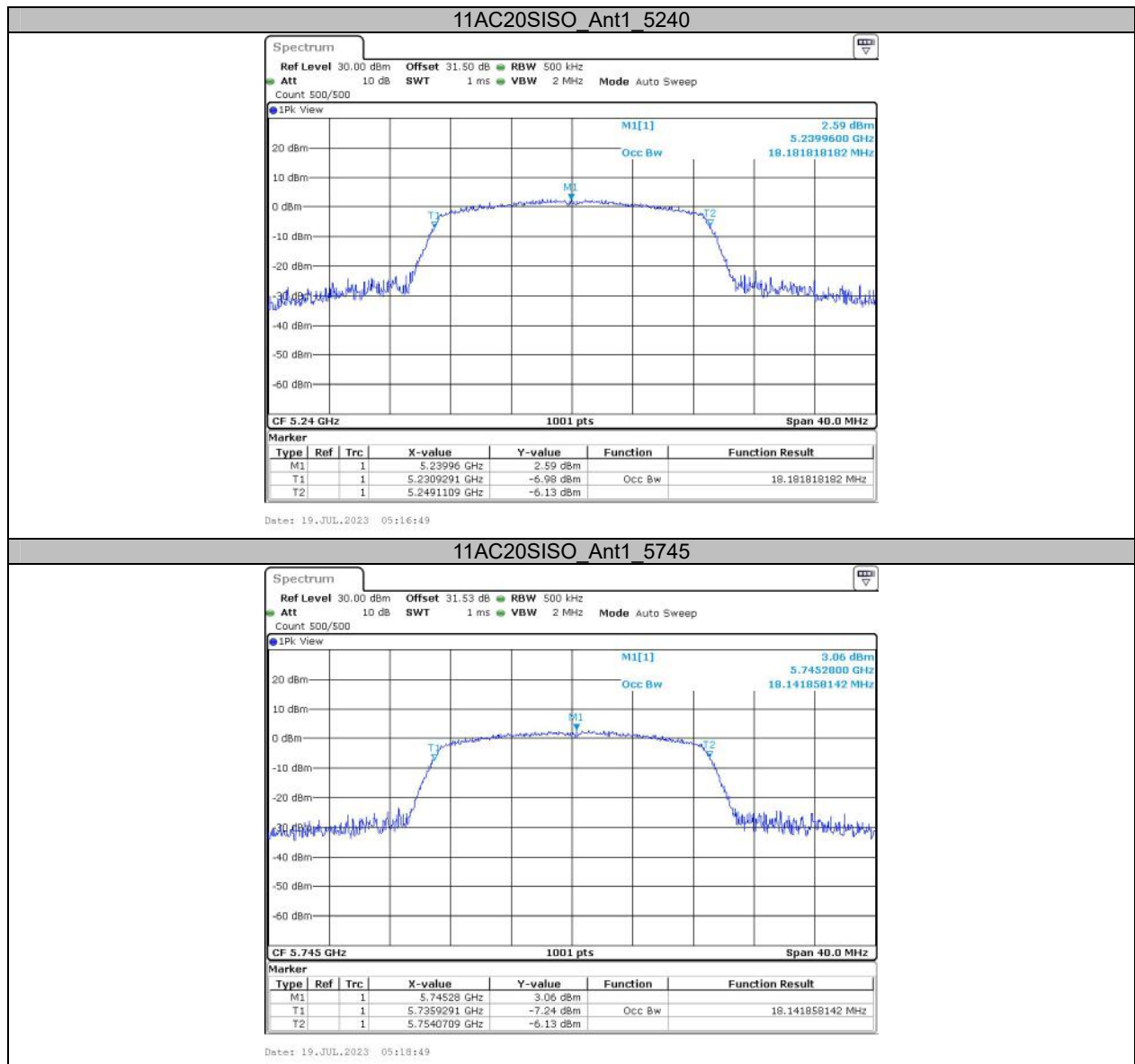


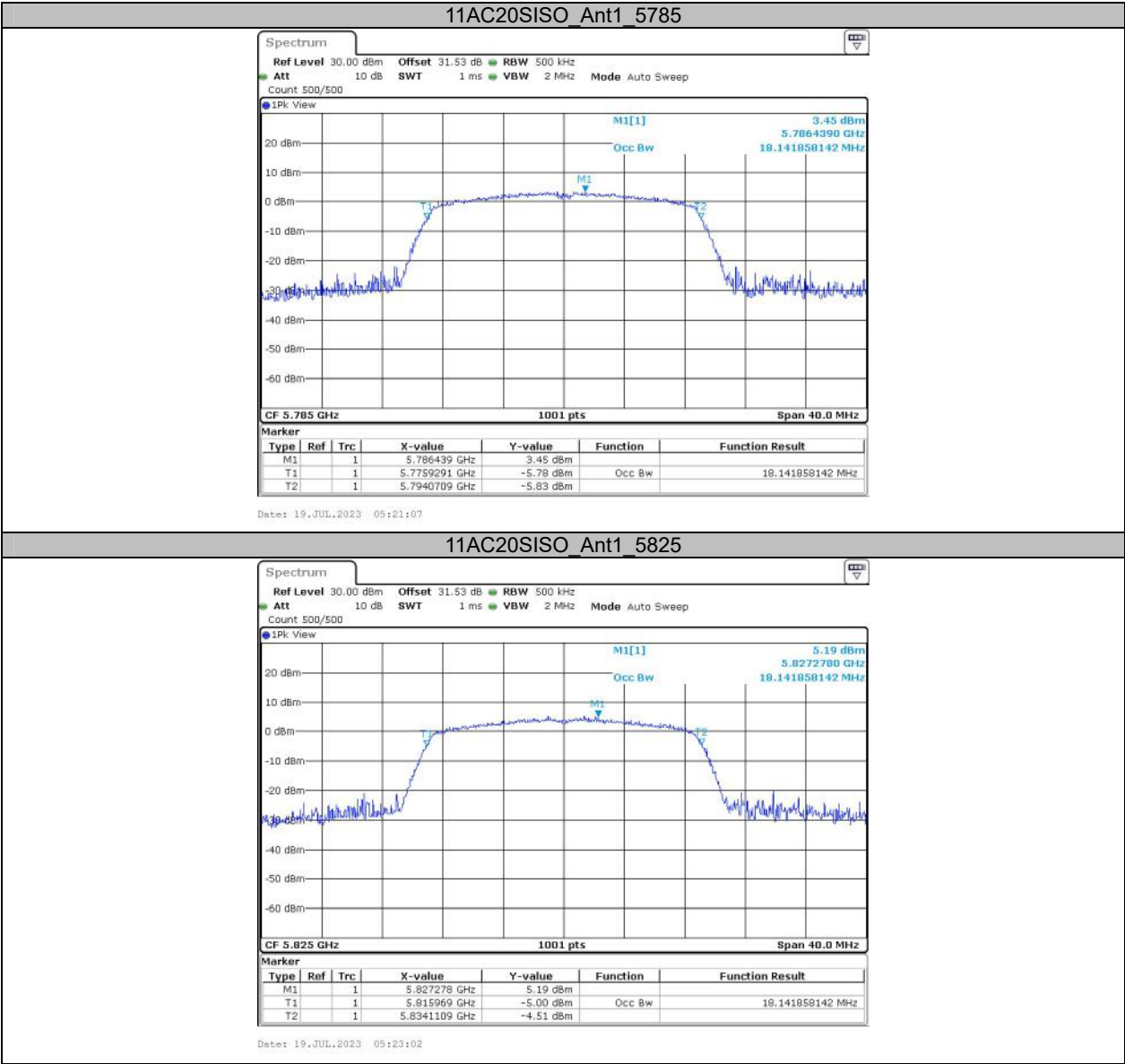
11AC20SISO_Ant1_5180

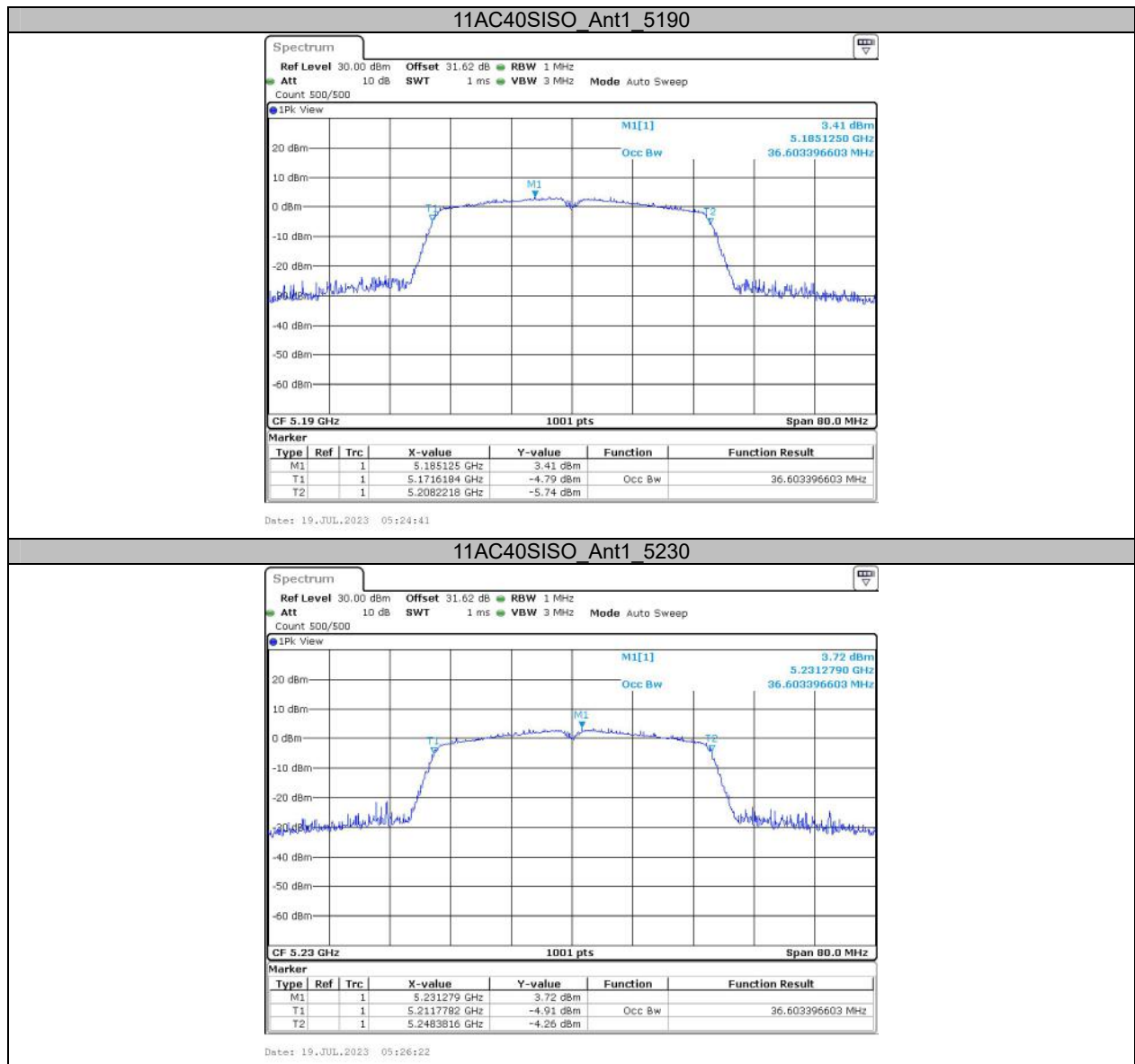


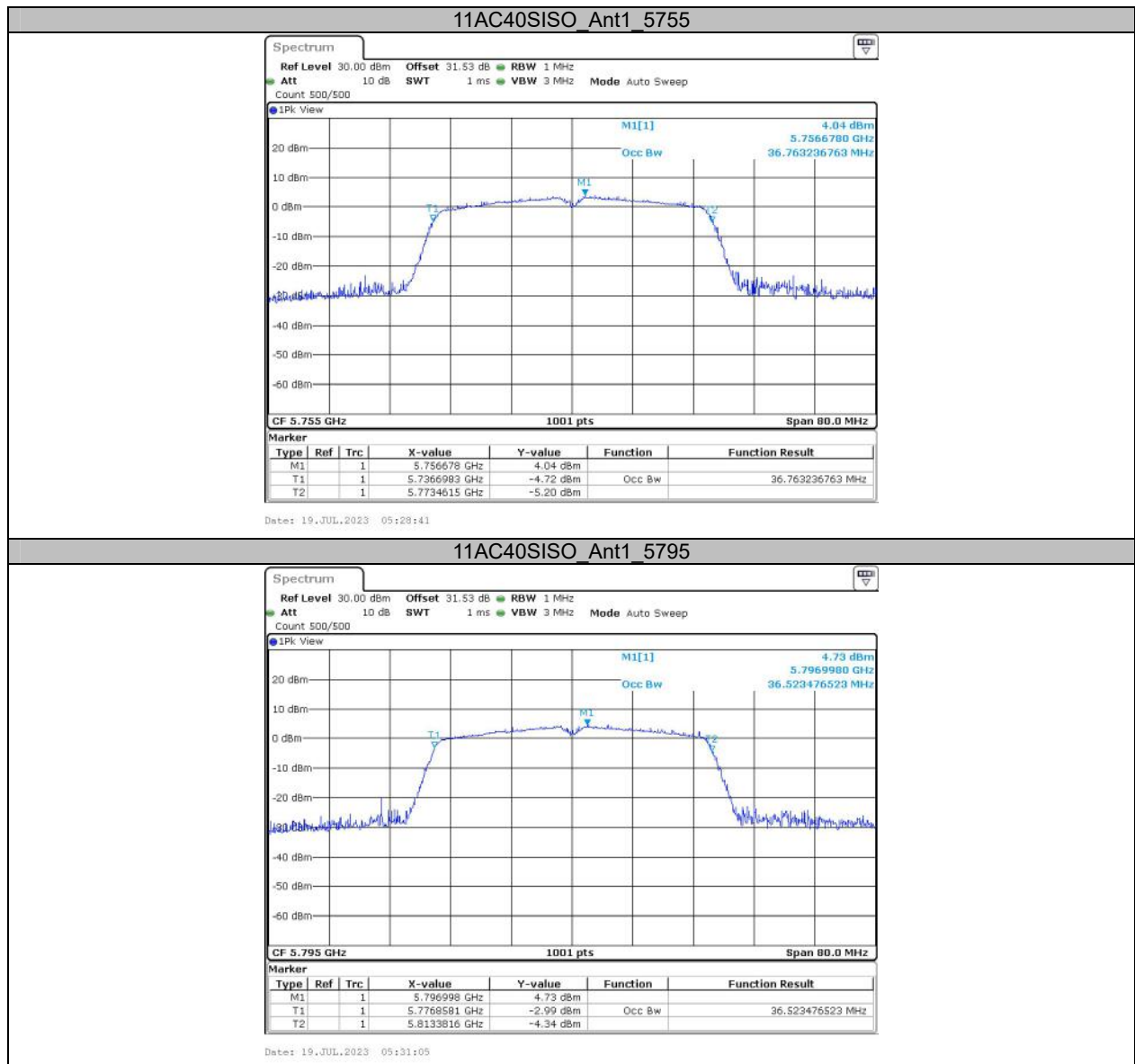
11AC20SISO_Ant1_5200

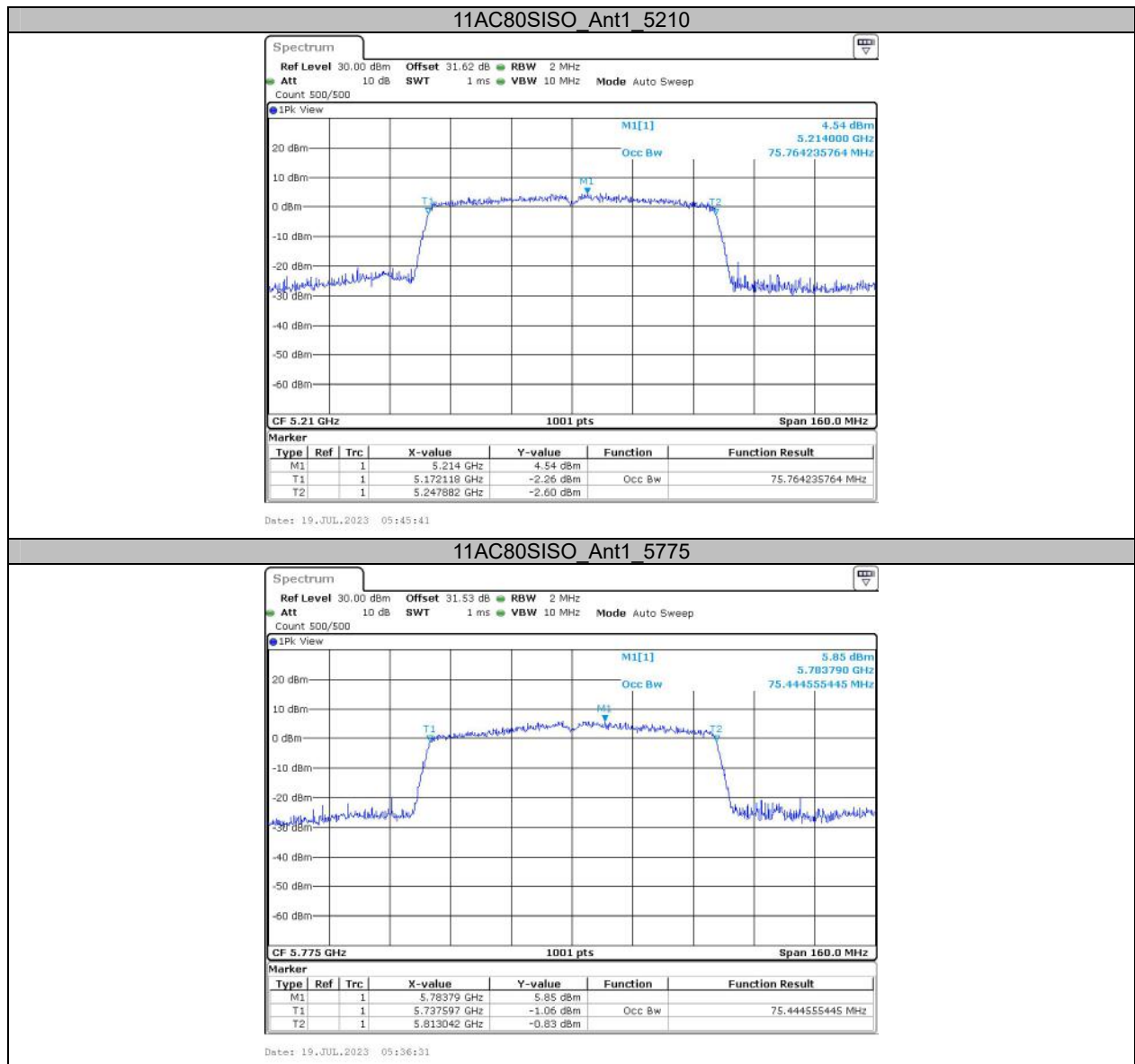








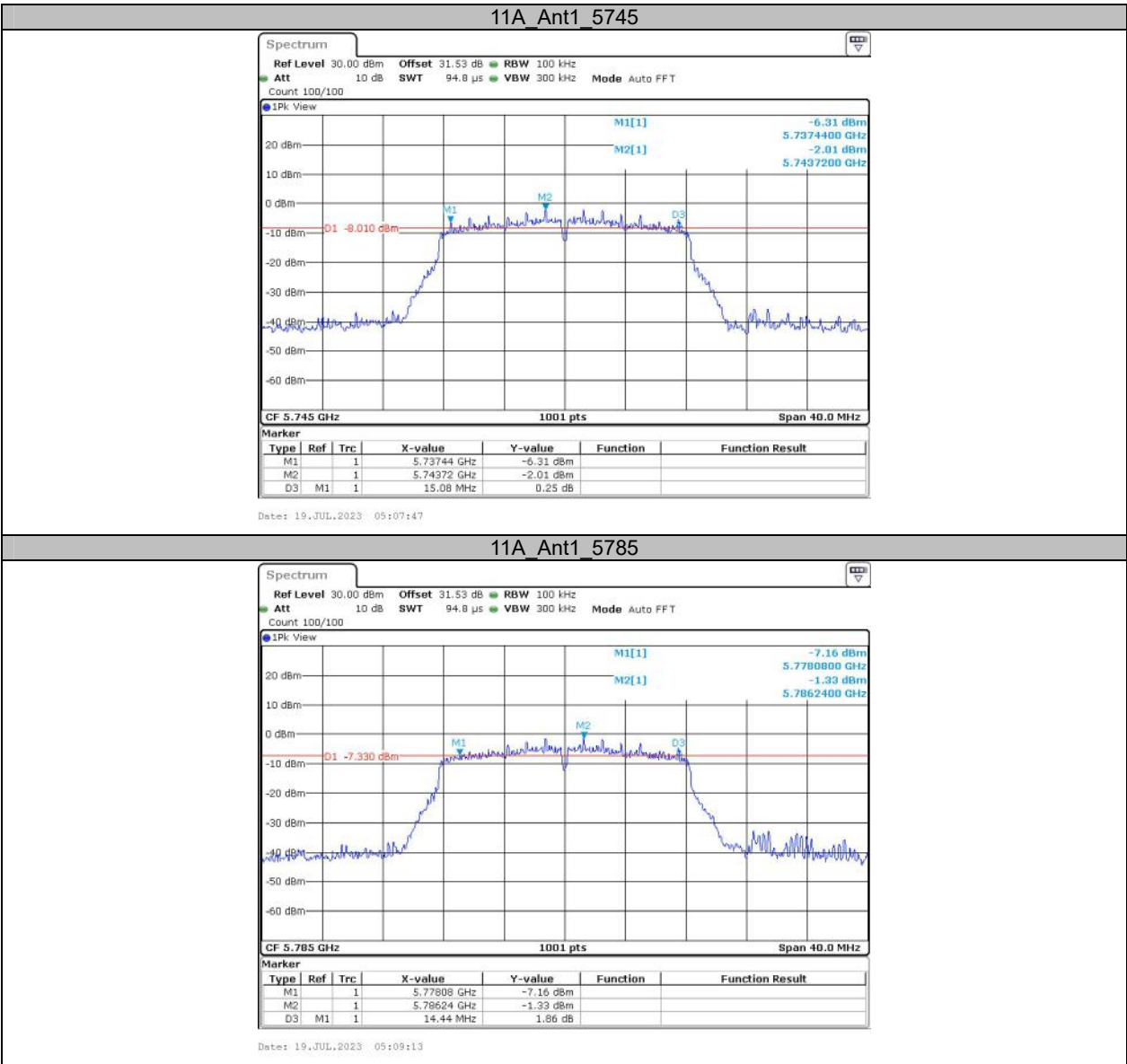


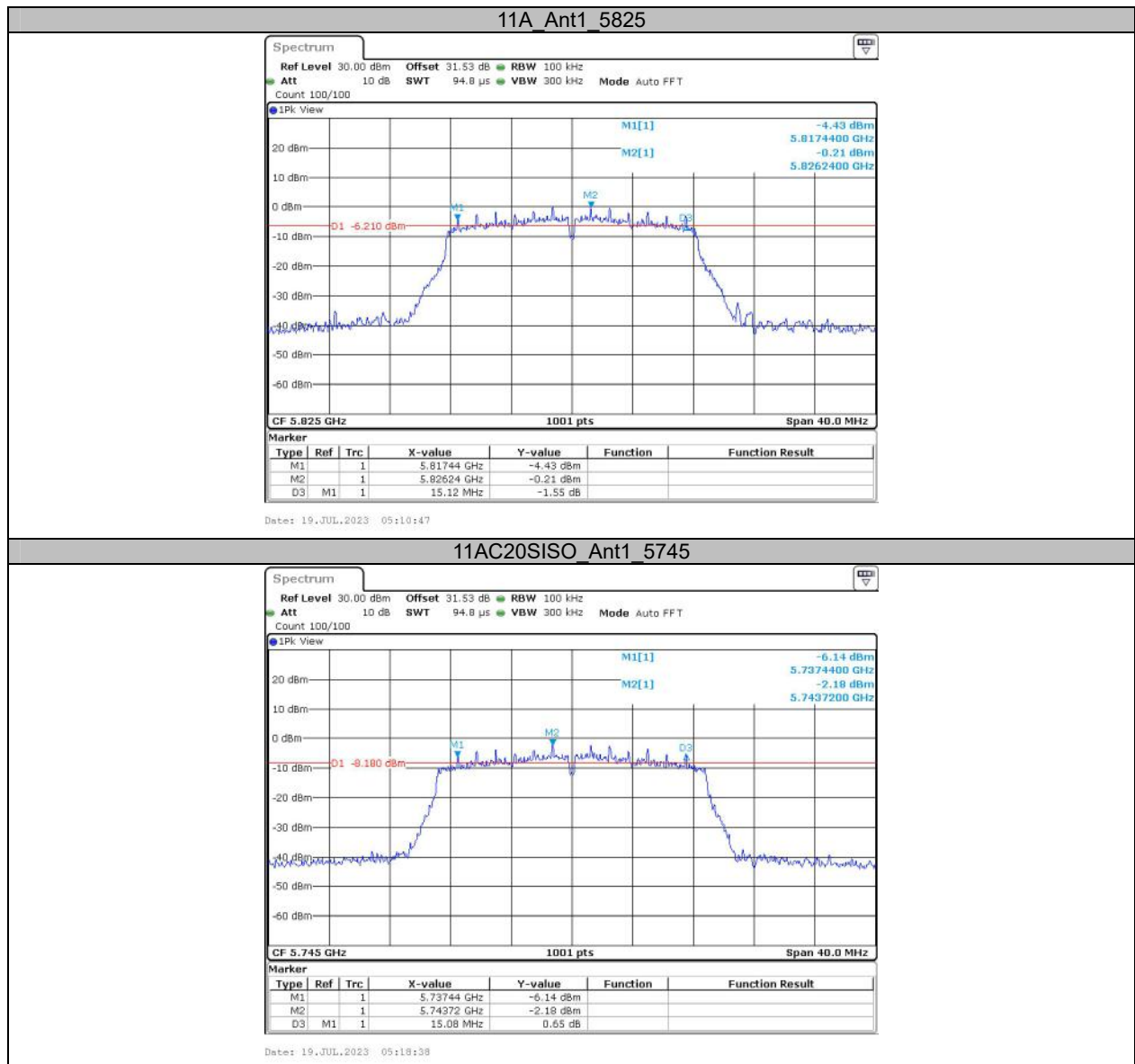


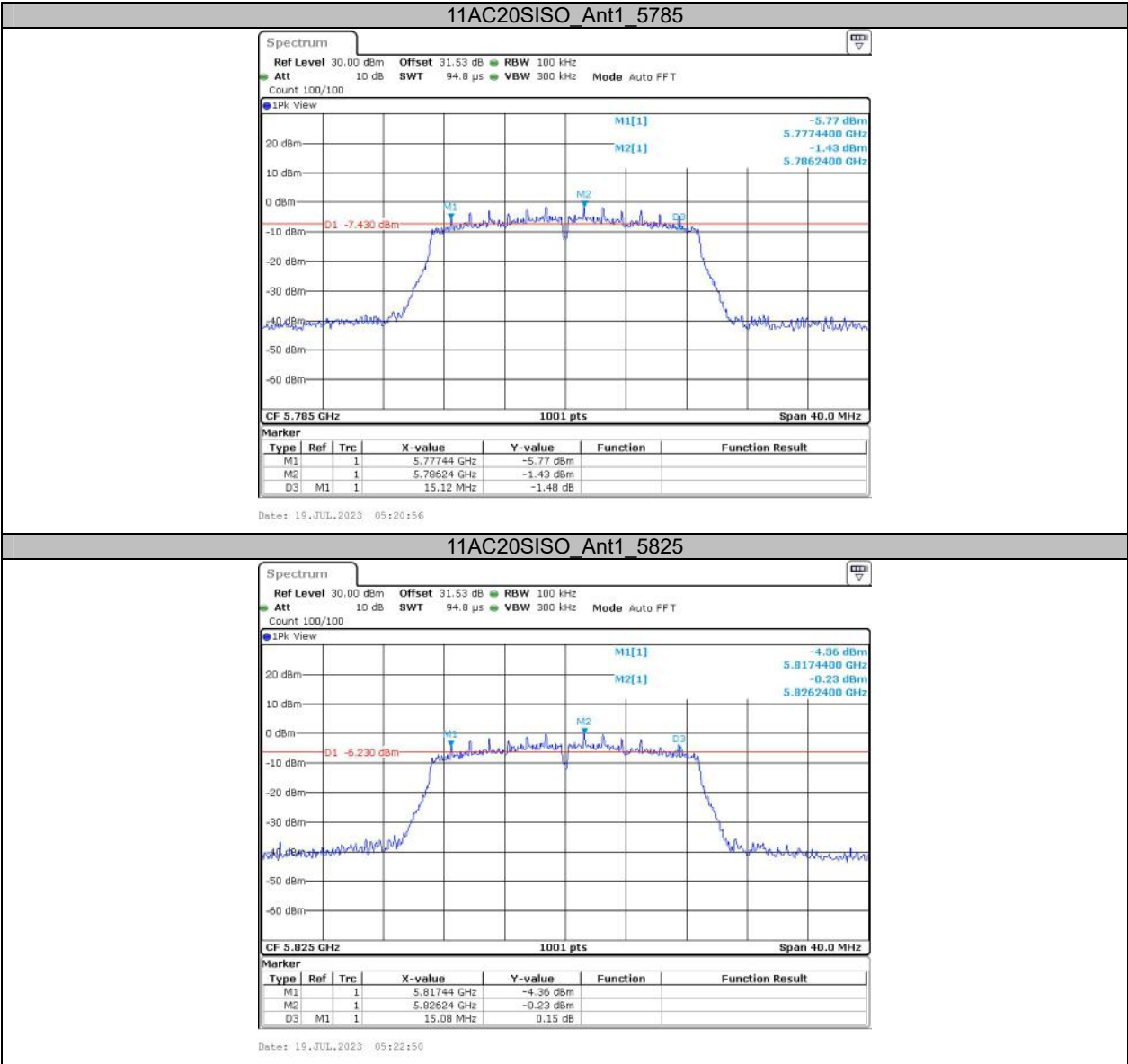
**Appendix A3: Min emission bandwidth
Test Result B4**

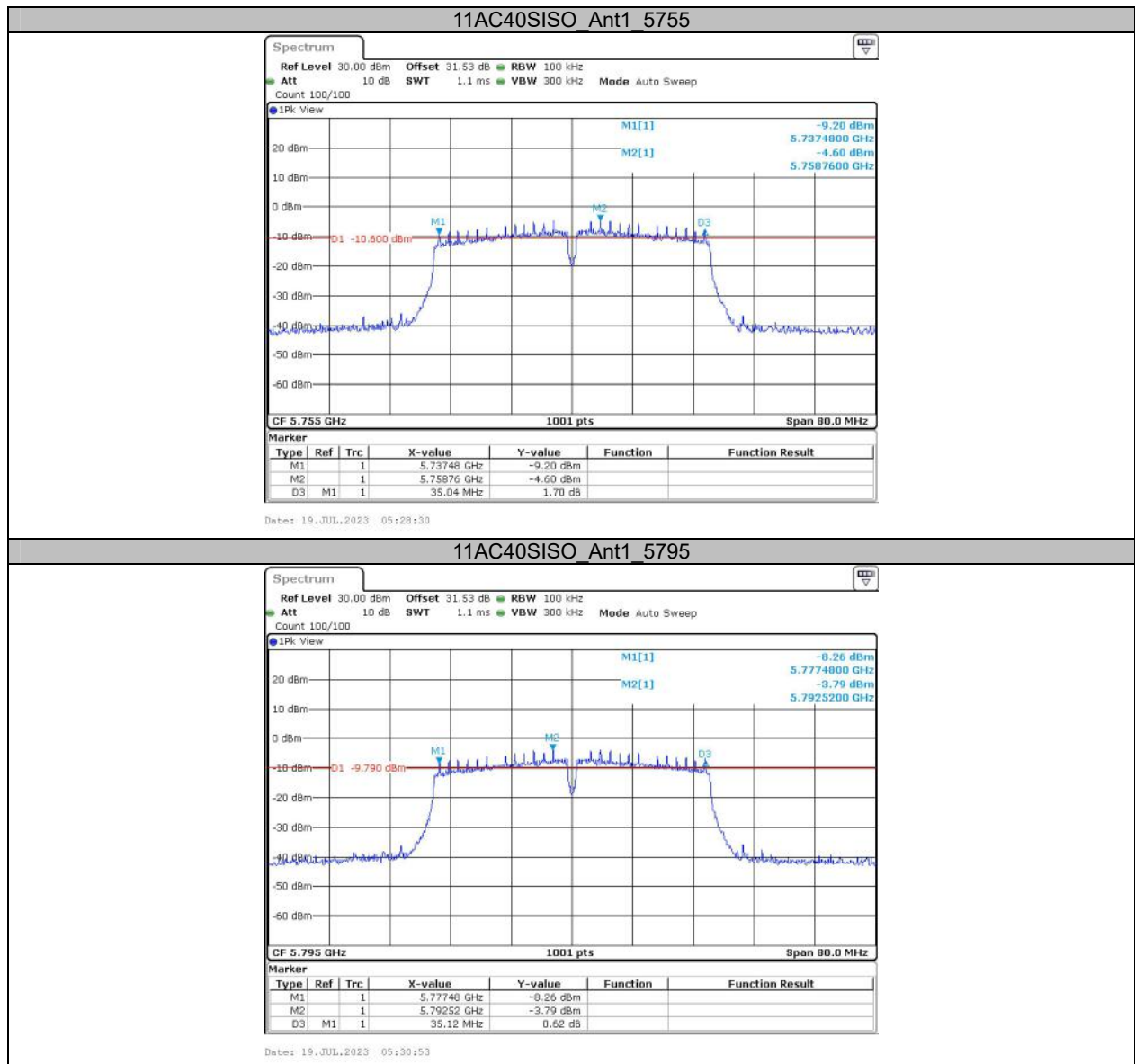
Test Mode	Antenna	Frequency[MHz]	6db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	15.08	5737.44	5752.52	0.5	PASS
		5785	14.44	5778.08	5792.52	0.5	PASS
		5825	15.12	5817.44	5832.56	0.5	PASS
11AC20SISO	Ant1	5745	15.08	5737.44	5752.52	0.5	PASS
		5785	15.12	5777.44	5792.56	0.5	PASS
		5825	15.08	5817.44	5832.52	0.5	PASS
11AC40SISO	Ant1	5755	35.04	5737.48	5772.52	0.5	PASS
		5795	35.12	5777.48	5812.60	0.5	PASS
11AC80SISO	Ant1	5775	75.20	5737.40	5812.60	0.5	PASS

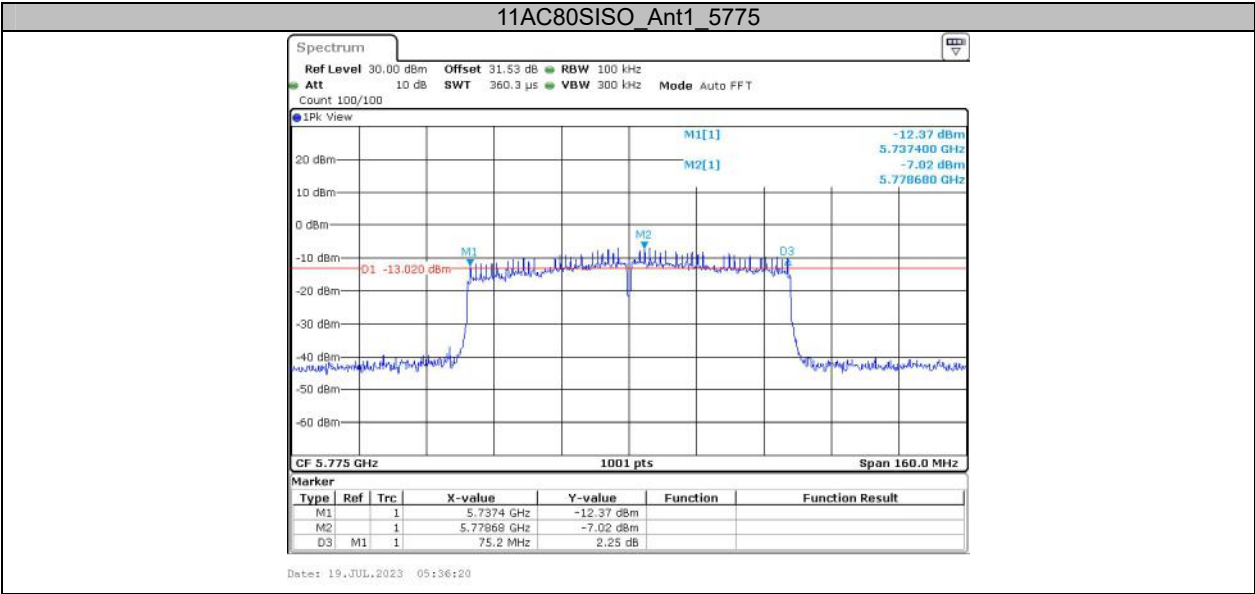
Test Graphs B4











**Appendix B: Duty Cycle
Test Result**

Test Mode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty cycle Correction Factor (dB)	1/T Minimum VBW (kHz)
11A	Ant1	5180	1.39	1.44	96.53	0.15	0.72
11AC20SISO	Ant1	5180	1.31	1.35	97.04	0.13	0.76
11AC40SISO	Ant1	5190	0.65	0.70	92.86	0.32	1.54
11AC80SISO	Ant1	5210	0.32	0.37	86.49	0.63	3.13

Test Graphs





Appendix C: Maximum conducted output power Test Result

Test Mode	Antenna	Frequency[MHz]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	8.59	≤23.98	PASS
		5200	7.71	≤23.98	PASS
		5240	8.23	≤23.98	PASS
		5745	8.49	≤30.00	PASS
		5785	9.25	≤30.00	PASS
		5825	10.43	≤30.00	PASS
11AC20SISO	Ant1	5180	8.44	≤23.98	PASS
		5200	7.75	≤23.98	PASS
		5240	8.13	≤23.98	PASS
		5745	8.34	≤30.00	PASS
		5785	9.04	≤30.00	PASS
11AC40SISO	Ant1	5825	10.33	≤30.00	PASS
		5190	8.24	≤23.98	PASS
		5230	7.89	≤23.98	PASS
		5755	8.48	≤30.00	PASS
		5795	9.25	≤30.00	PASS
11AC80SISO	Ant1	5210	7.92	≤23.98	PASS
		5775	8.85	≤30.00	PASS

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

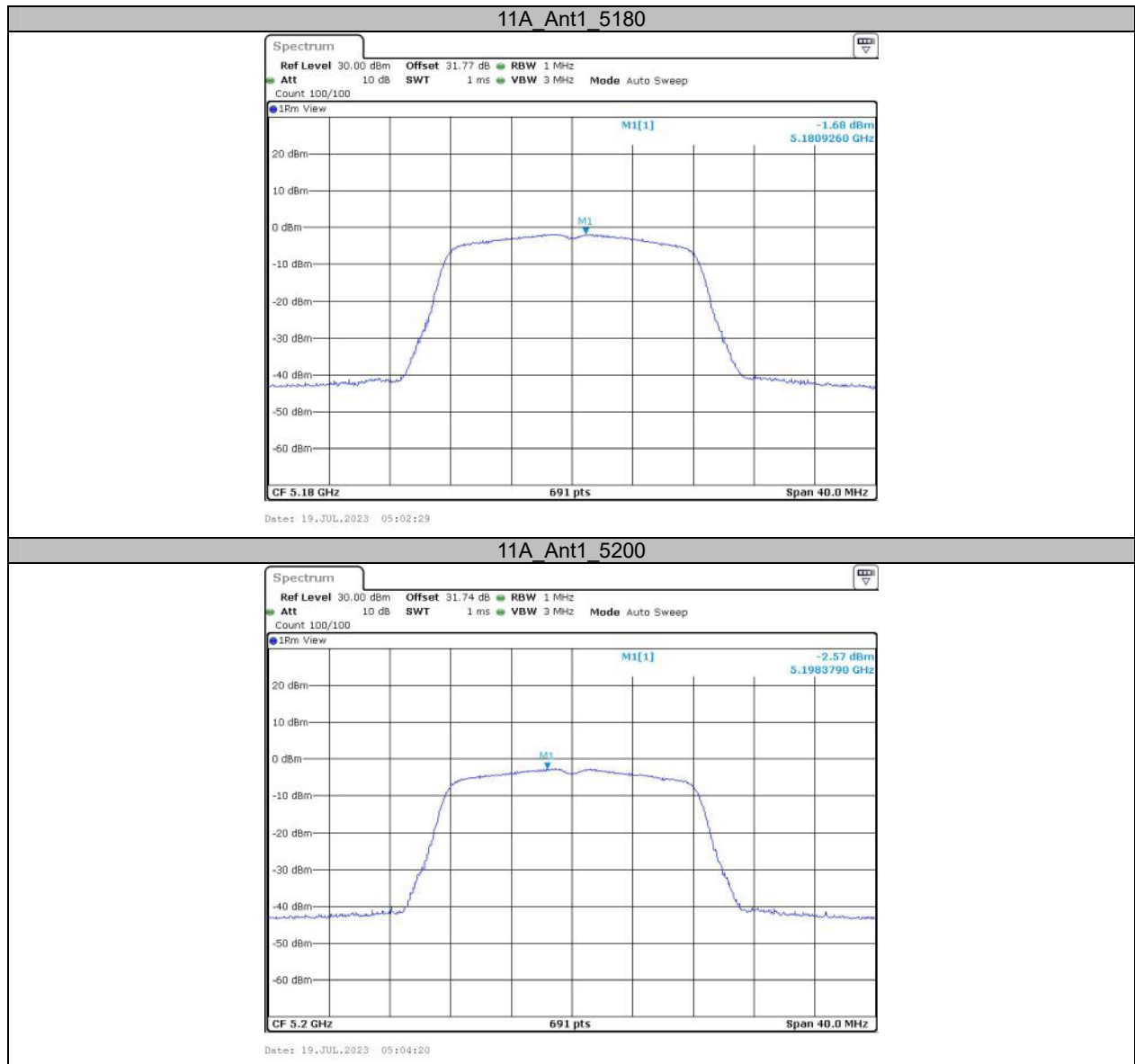
Appendix D: Maximum power spectral density Test Result

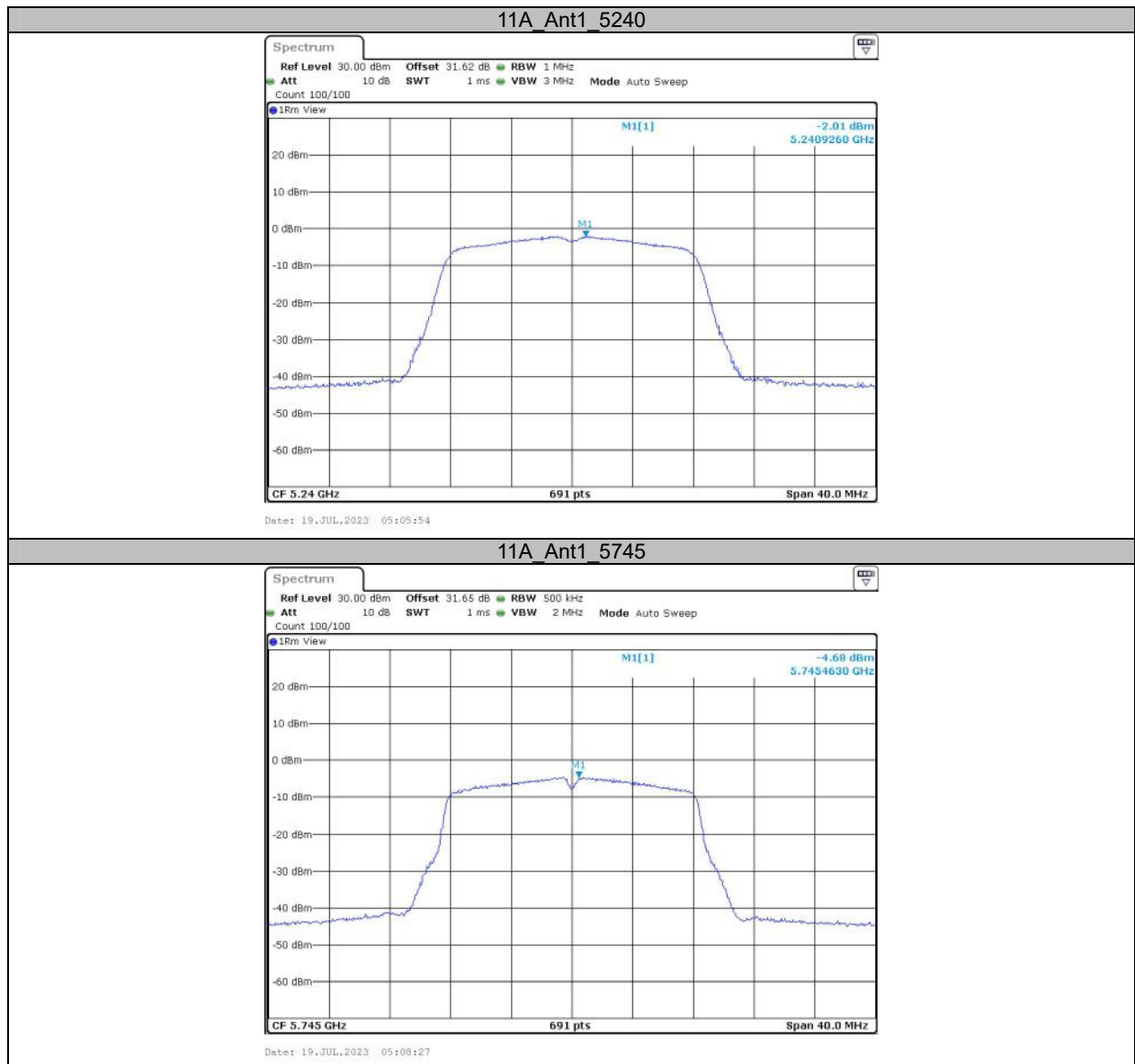
Test Mode	Antenna	Frequency[MHz]	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	-1.68	≤11.00	PASS
		5200	-2.57	≤11.00	PASS
		5240	-2.01	≤11.00	PASS
		5745	-4.68	≤30.00	PASS
		5785	-3.95	≤30.00	PASS
		5825	-2.53	≤30.00	PASS
11AC20SISO	Ant1	5180	-1.89	≤11.00	PASS
		5200	-2.89	≤11.00	PASS
		5240	-2.31	≤11.00	PASS
		5745	-5.02	≤30.00	PASS
		5785	-4.39	≤30.00	PASS
		5825	-2.91	≤30.00	PASS
11AC40SISO	Ant1	5190	-5.29	≤11.00	PASS
		5230	-5.15	≤11.00	PASS
		5755	-7.83	≤30.00	PASS
		5795	-6.97	≤30.00	PASS
11AC80SISO	Ant1	5210	-8.94	≤11.00	PASS
		5775	-10.49	≤30.00	PASS

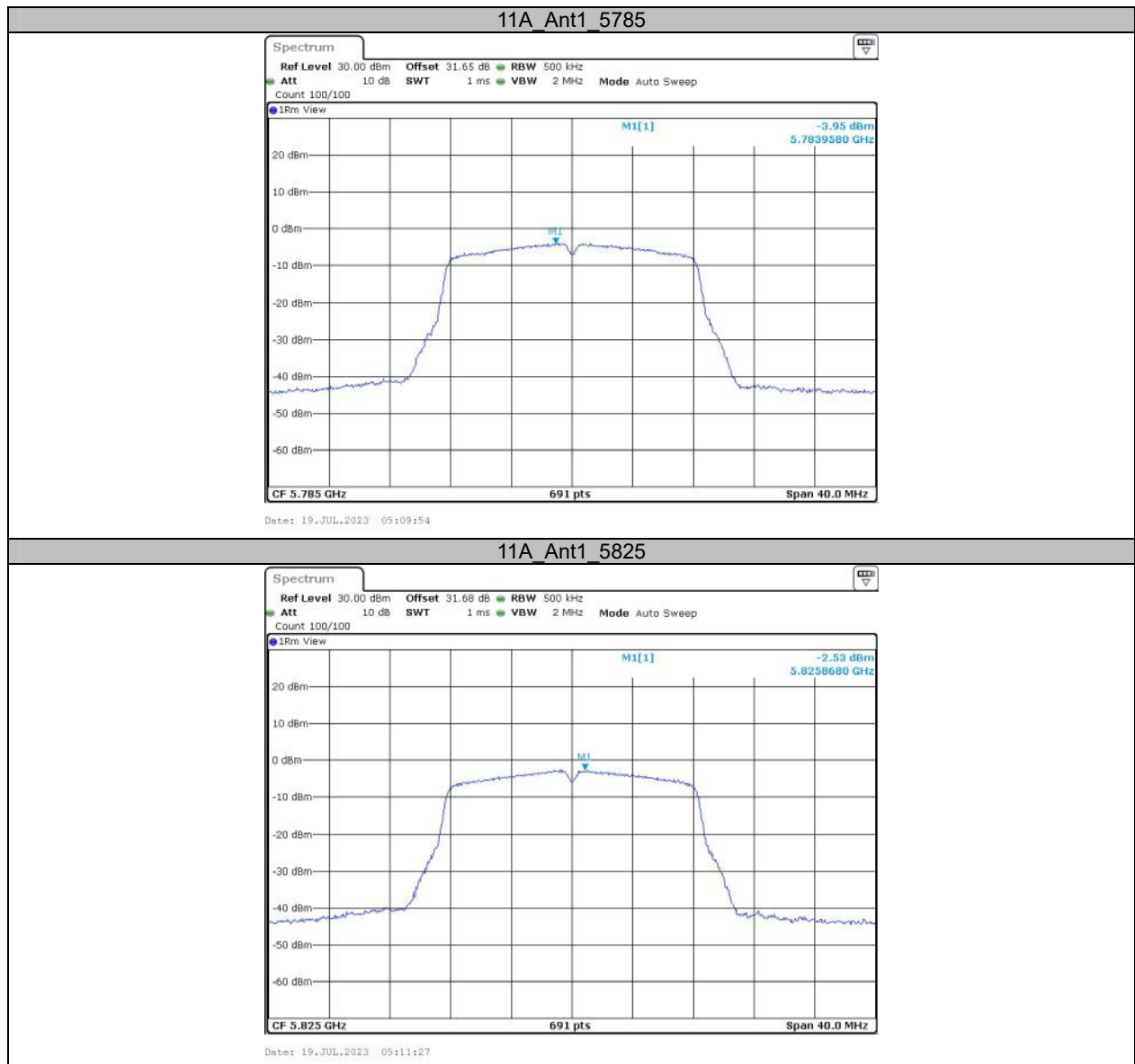
Note: 1. The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.

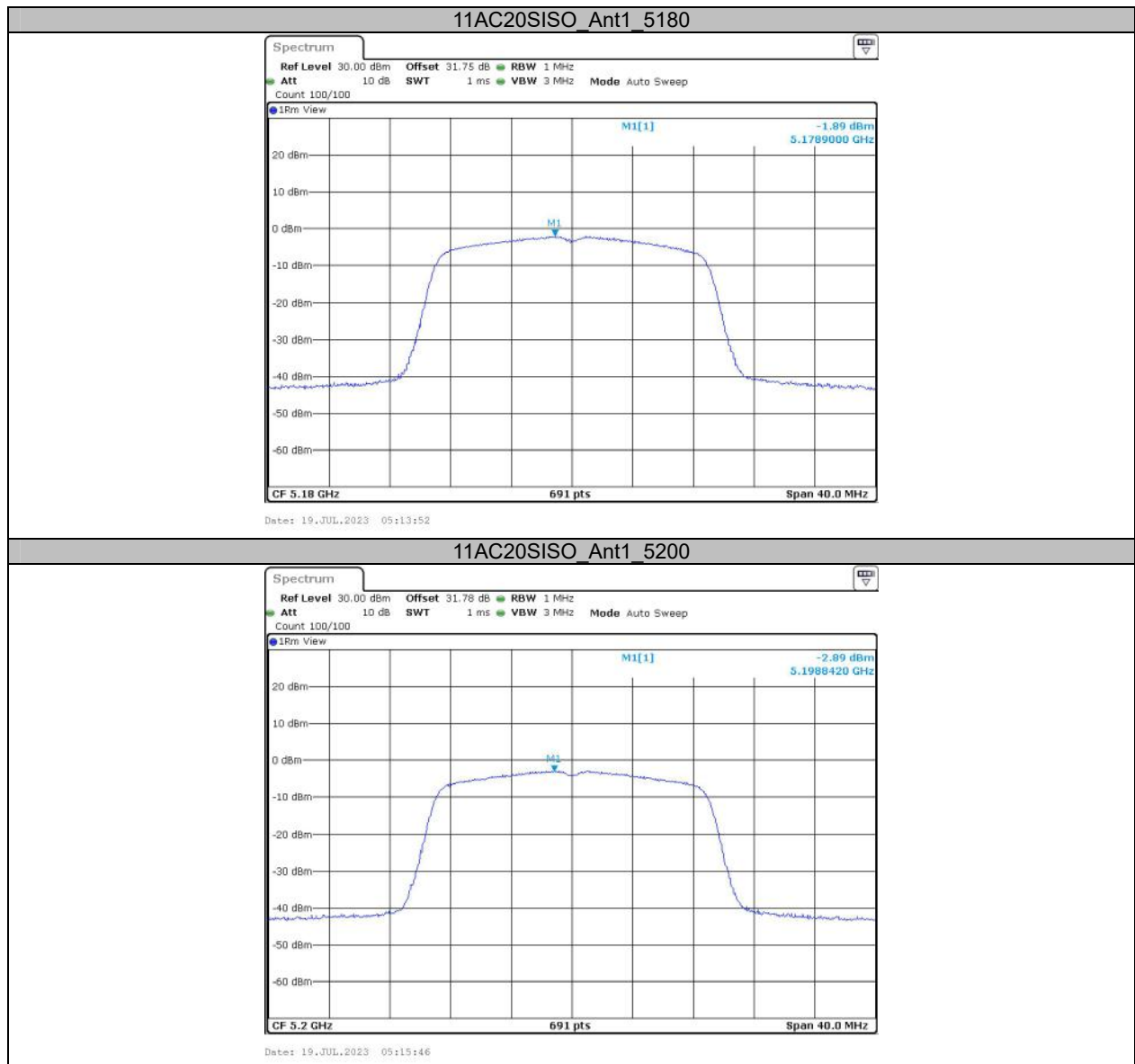
2. The Duty Cycle Factor is compensated in the graph.

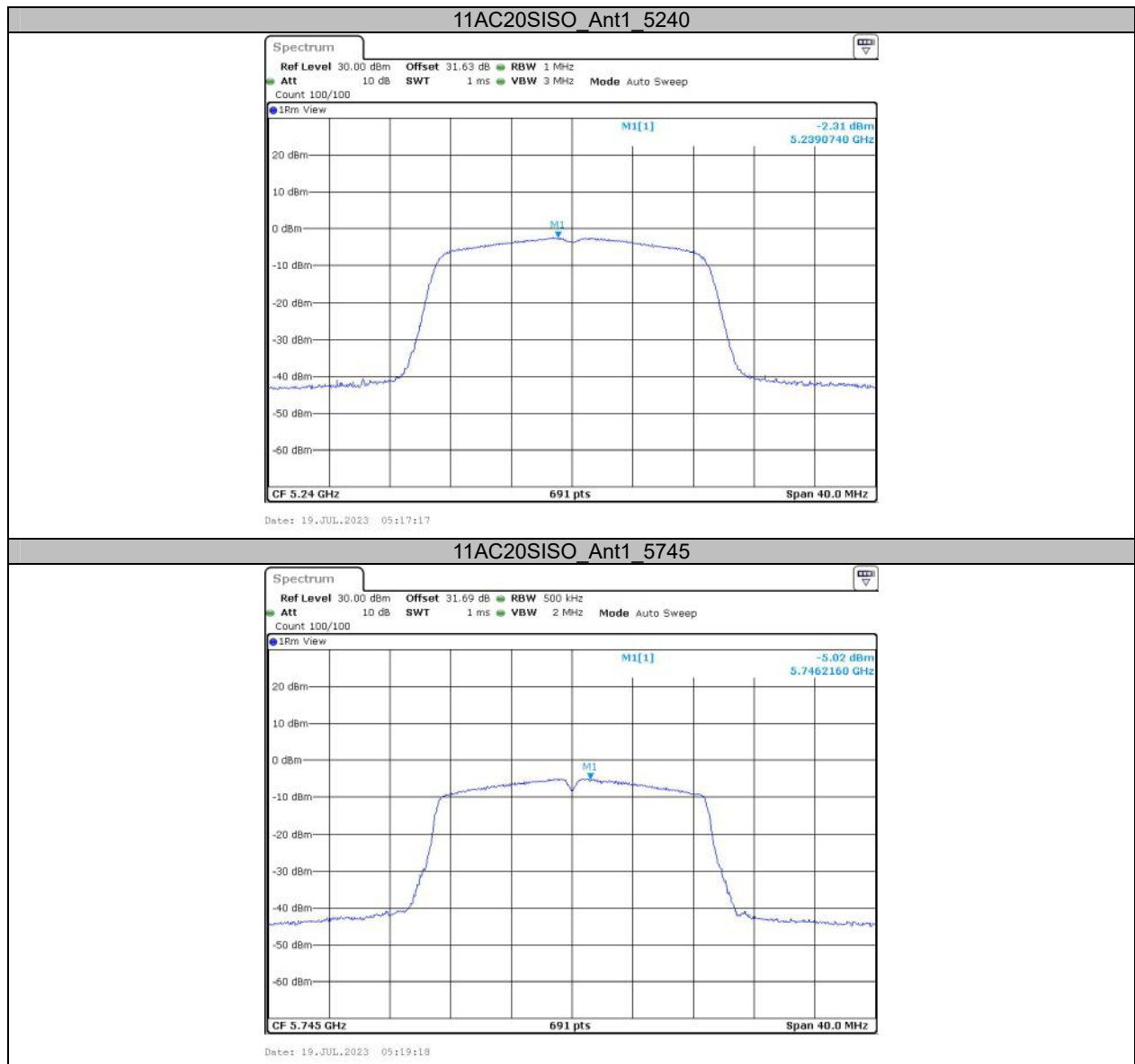
Test Graphs

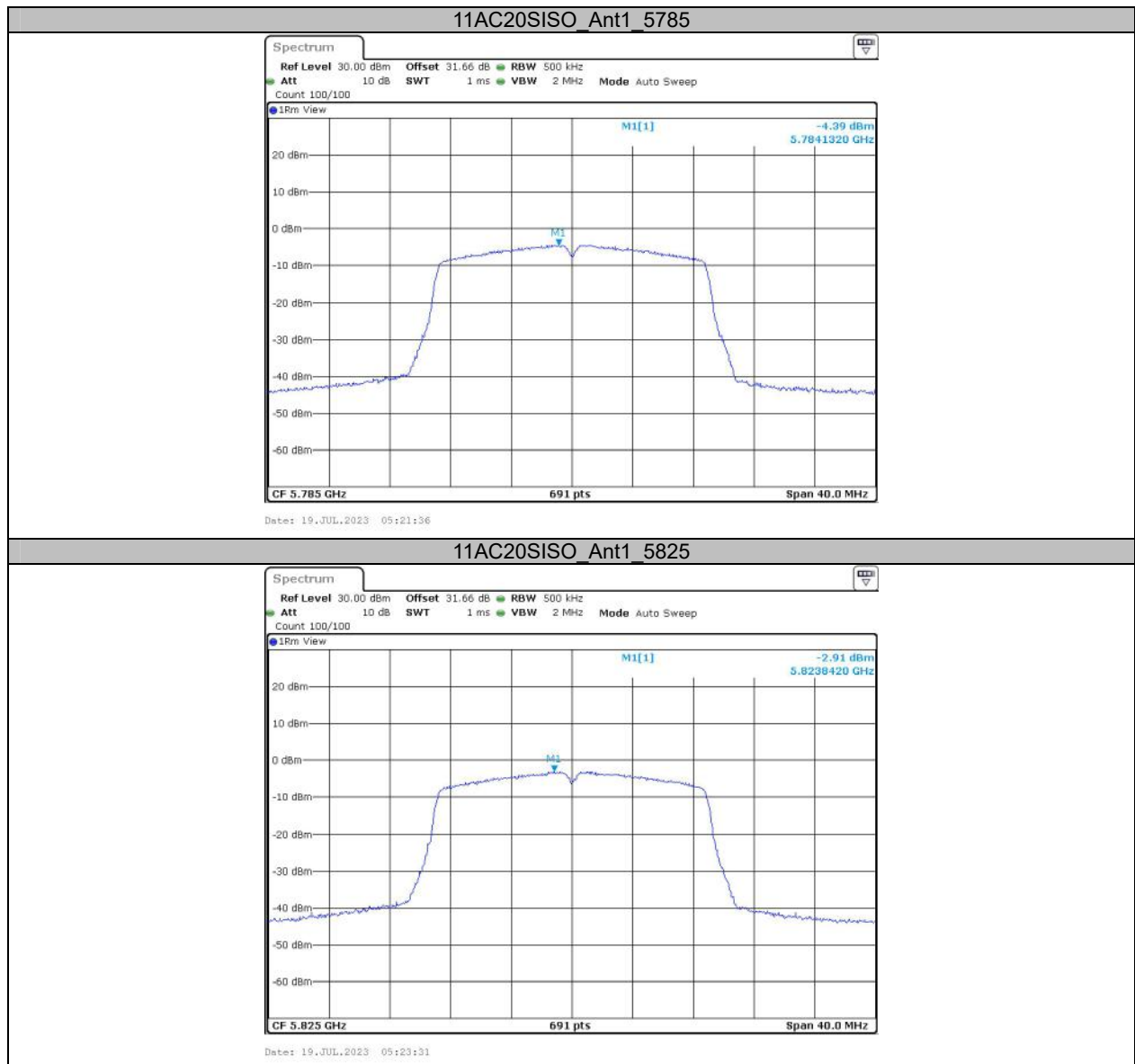


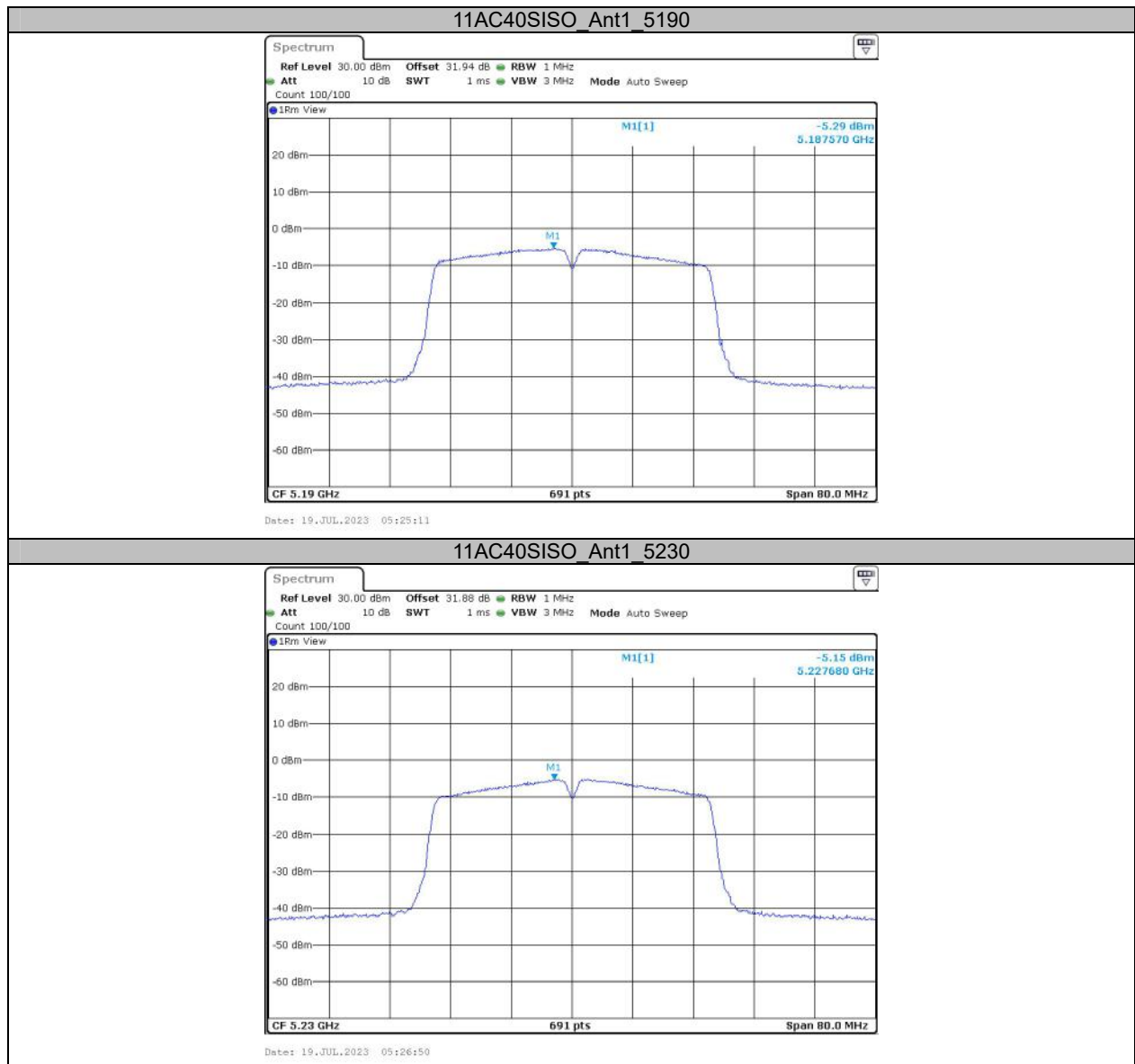


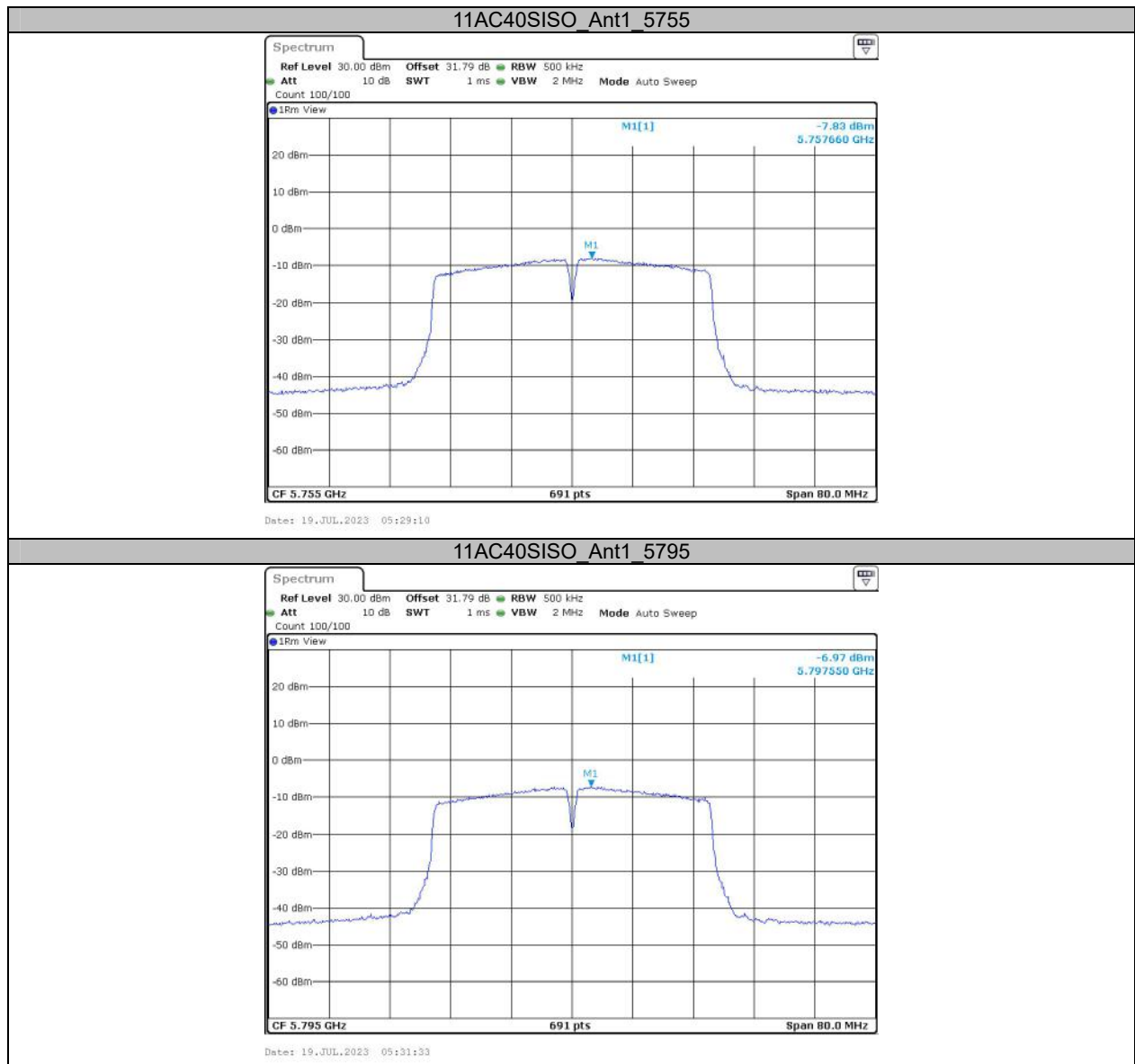


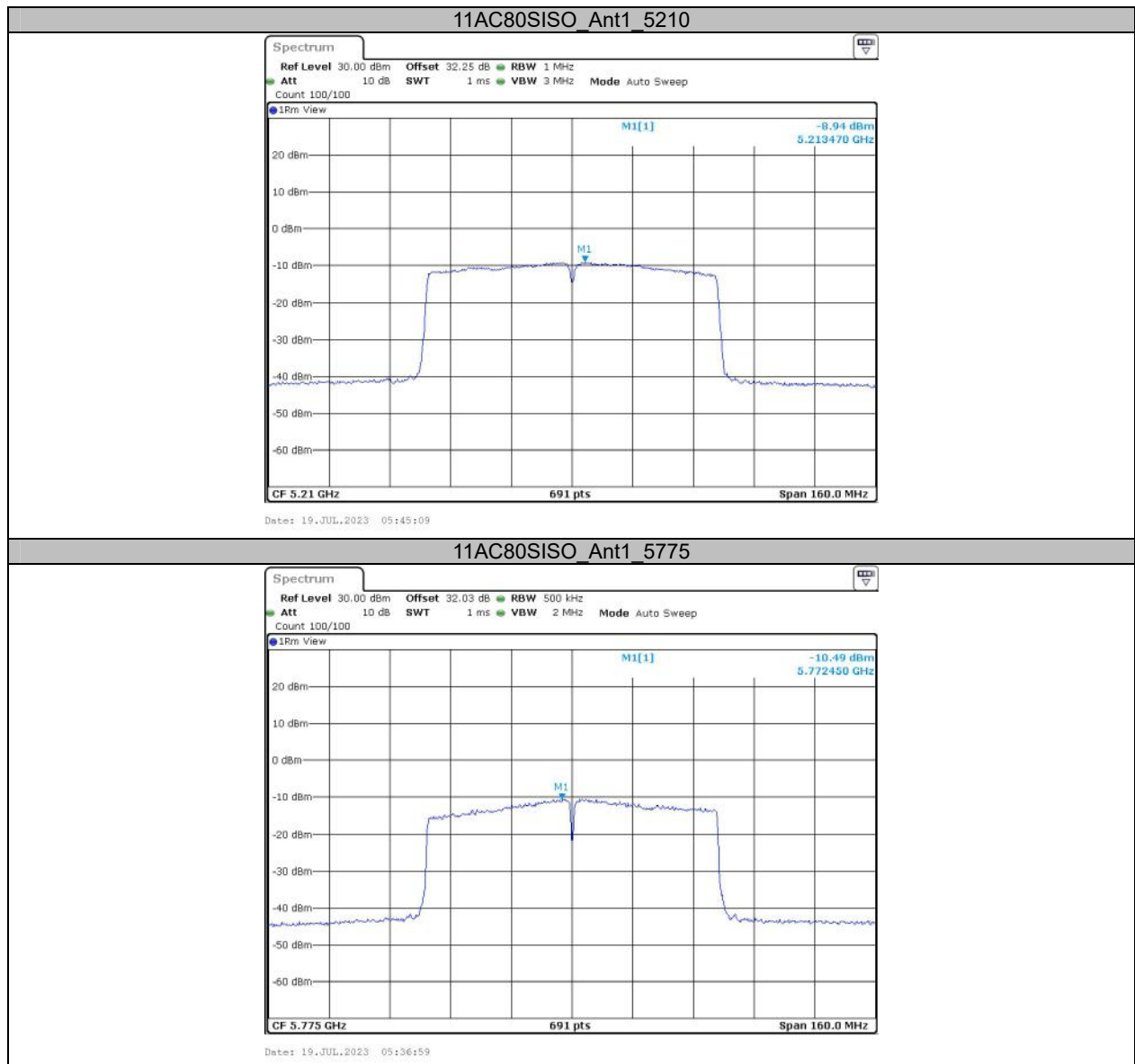












***** END OF REPORT *****