

FCC PART 15.407

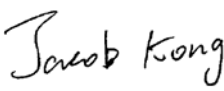
TEST REPORT

For

Shenzhen NED Optics Co., LTD.

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FCC ID: 2ATNDGOOVISC10

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Wireless Cast
Tested Model	C10
Frequency Range	5G Wi-Fi: 5150-5250MHz; 5725-5850MHz
Maximum Conducted Average Output Power	Wi-Fi: 5150-5250 MHz: 11.03dBm (802.11a), 10.95dBm(802.11n20), 8.32dBm(802.11n40) 10.75dBm (802.11ac20), 7.97dBm(802.11 ac40), 4.94dBm(802.11 ac80) 5725-5850 MHz: 12.08dBm (802.11a), 12.52dBm(802.11n20), 10.22dBm(802.11n40) 11.74dBm (802.11ac20), 10.05m(802.11 ac40), 5.41dBm(802.11 ac80)
Modulation Technique	OFDM
Antenna Specification*	2.81 dBi (It is provided by the applicant)
Voltage Range	DC3.8V from battery or DC 5.0V from USB port
Date of Test	2021-01-05 to 2021-04-19
Sample serial number	RSZ201222012-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020-12-22
Sample/EUT Status	Good condition

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 Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Output Power with Power meter		±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
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 Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) ,6F,7F,the 3rd Phase of Wan Li Industrial Building D,Shihua Rd, FuTian Free Trade Zone, Shenzhen, 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.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT has one antenna for 5G Wi-Fi, it can operate in 802.11a/n20/n40/ac20/ac40/ac80 modes.

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, 802.11n20, 802.11ac20 channel 36, 40, 48 were tested; For 802.11n40, 802.11ac40 channel 38, 46 were tested; For 802.11ac80, 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, 802.11n20, 802.11ac20 channel 149, 157, 165 were tested; For 802.11n40, 802.11ac40 channel 151, 159 were tested; For 802.11ac80, channel 155 was tested.

EUT Exercise Software

“relteak”** software was use to the EUT tested.

Test frequencies and power level were configured as below:

U-NII	Mode	Frequency (MHz)	Rate (Mbps)	Power Level*
5150 – 5250MHz	802.11 a	5180	6	50
		5200	6	50
		5240	6	50
	802.11 n20	5180	MCS0	50
		5200	MCS0	50
		5240	MCS0	50
	802.11 n40	5190	MCS0	45
		5230	MCS0	45
	802.11 ac20	5180	MCS0	50
		5200	MCS0	50
		5240	MCS0	50
	802.11 ac40	5190	MCS0	45
		5230	MCS0	45
	802.11 ac80	5210	MCS0	45
5725 – 5850MHz	802.11 a	5745	6	50
		5785	6	50
		5825	6	50
	802.11 n20	5745	MCS0	50
		5785	MCS0	50
		5825	MCS0	50
	802.11 n40	5755	MCS0	45
		5795	MCS0	45
	802.11 ac20	5745	MCS0	50
		5785	MCS0	50
		5825	MCS0	50
	802.11 ac40	5755	MCS0	45
		5795	MCS0	45
	802.11 ac80	5775	MCS0	45

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

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

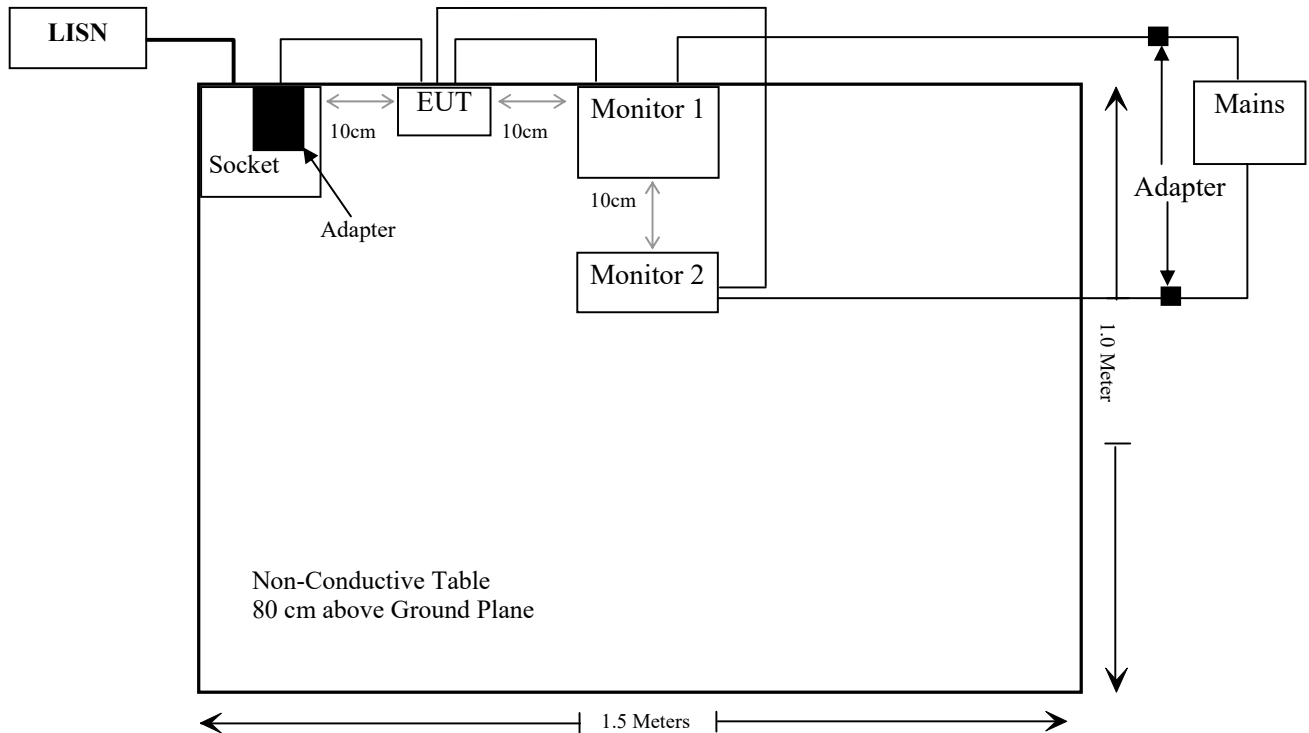
Manufacturer	Description	Model	Serial Number
BLU	Adapter	US-CR-2000	E484351
SAMSUNG	Monitor 1	CR22WS	CR22HVZP401073M
SAMSUNG	Monitor 2	S24E390HL	ZZFRH4ZN303357K

External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Un-detachable AC Cable	1.0	Socket	LISN
Unshielded Detachable DC Cable	1.0	Adapter	EUT
Shielded Detachable HDMI Cable	1.0	EUT	Monitor 1
Shielded Detachable Type-C to HDMI Cable	1.5	EUT	Monitor 2
Unshielded detachable AC Cable*2	1.0	Mains	Adapter
Unshielded detachable DC Cable*2	1.5	Adapter	Monitor

Block Diagram of Test Setup

Conducted Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.407 (f), §1.1307 (b)(1), §2.1091	Maximum Permissible Exposure(MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b) (1), (4), (6) (7)	Undesirable Emission& Restricted Bands	Compliance
§15.407(a) (1), (5),(e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliance
§15.407(a)(1), (3)	Conducted Transmitter Output Power	Compliance
§15.407 (a)(1), (3)	Power Spectral Density	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2020/08/04	2021/08/03
Rohde & Schwarz	LISN	ENV216	101613	2020/08/04	2021/08/03
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
Radiated Emission Test (Below 1G)					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
Radiated Emission Test (Above 1G)					
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2020/08/04	2021/08/03
COM-POWER	Pre-amplifier	PA-122	181919	2020/11/29	2021/11/28
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2020/11/29	2021/11/28
Sunol Sciences	Horn Antenna	3115	9107-3694	2008/01/15	2021/01/14
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2020/11/29	2021/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2020/11/29	2021/11/28
Ducommun technologies	RF Cable	RG-214	1	2020/11/12	2021/11/12
Ducommun technologies	RF Cable	RG-214	2	2020/11/12	2021/11/12
SNSD	Band Reject filter	BSF5150-5850MN-0899-004	5G filter	2020/04/20	2021/04/20
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-02 1304	2020/12/06	2023/12/05
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-03	2020/12/06	2023/12/05

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Tonscend Corporation	RF control Unit	JS0806-2	19D8060154	2020/08/04	2021/08/03
Rohde & Schwarz	Signal and Spectrum Analyzer	FSV40	101473	2020/08/04	2021/08/03
Unknown	RF Cable	Unknown	2301 276	2020/11/29	2021/11/28

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.407(f) & §1.1307 (b) (1)& §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.407 (f) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (Minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Mode	Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
5G Wi-Fi	5150-5250	2.81	1.91	11.5	14.13	20	0.0054	1
	5725-5850	2.81	1.91	13.0	19.95	20	0.0076	1

Note: 1. the tune up conducted power was declared by the applicant

2. the 2.4G Wi-Fi cannot transmit at the same time with the 5G Wi-Fi.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

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 an internal antennas arrangement which was permanently attached and the antenna gain is 2.81dBi, fulfill the requirement of this section. Please refer to the EUT photos.

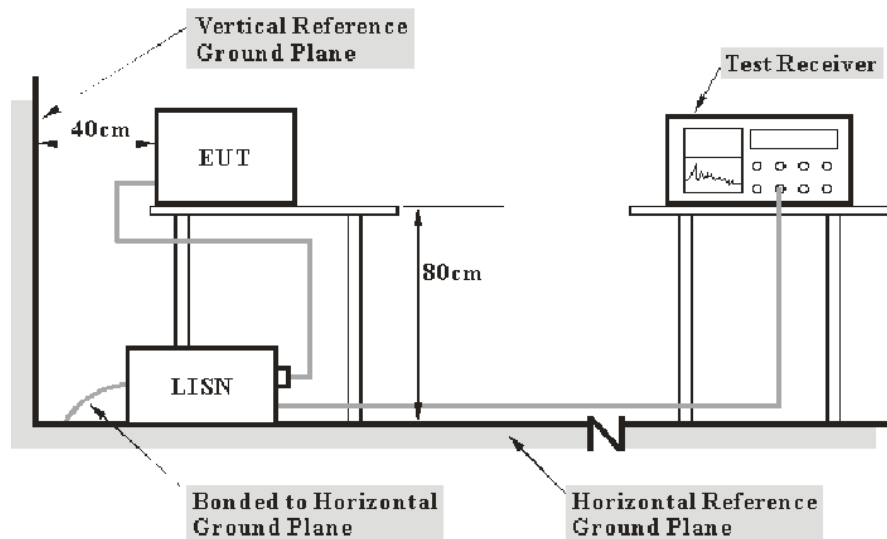
Result: Pass

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.

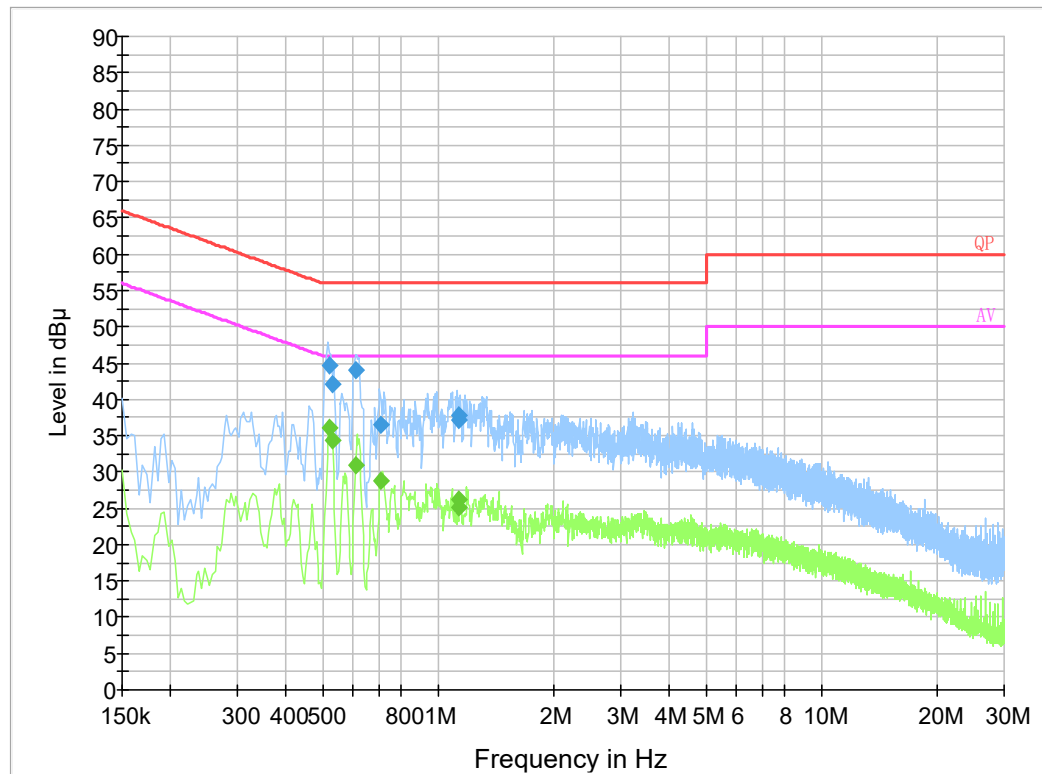
All data was recorded in the Quasi-peak and average detection mode.

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2021-01-07.

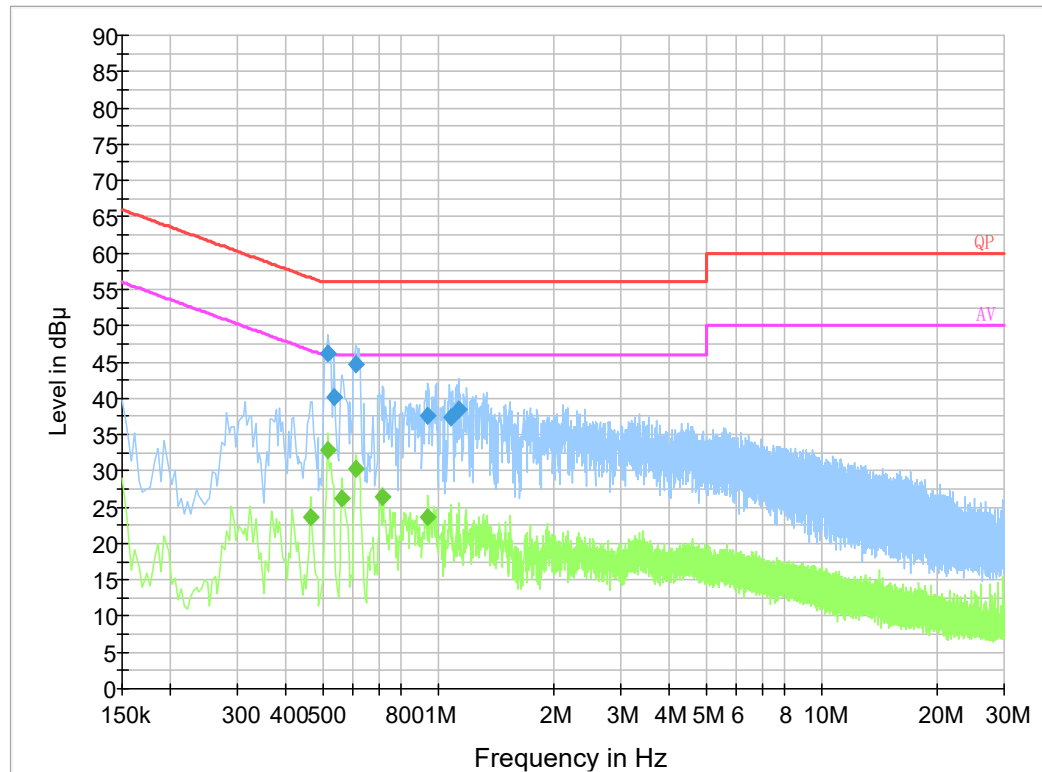
EUT operation mode: Transmitting (the worst case is Wi-Fi 802.11n20 Mode, 5745MHz)

AC 120V/60 Hz, Line:**Final Result 1**

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.522230	44.7	9.000	L1	19.8	11.3	56.0
0.529930	42.2	9.000	L1	19.8	13.8	56.0
0.608850	44.1	9.000	L1	19.8	11.9	56.0
0.711410	36.4	9.000	L1	19.8	19.6	56.0
1.129110	37.1	9.000	L1	19.8	18.9	56.0
1.137170	37.8	9.000	L1	19.8	18.2	56.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.522230	36.1	9.000	L1	19.8	9.9	46.0
0.529930	34.3	9.000	L1	19.8	11.7	46.0
0.608850	31.0	9.000	L1	19.8	15.0	46.0
0.711410	28.9	9.000	L1	19.8	17.1	46.0
1.129110	25.2	9.000	L1	19.8	20.8	46.0
1.137170	26.2	9.000	L1	19.8	19.8	46.0

AC 120V/60 Hz, Neutral:**Final Result 1**

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.514230	46.2	9.000	N	19.8	9.8	56.0
0.533930	40.1	9.000	N	19.8	15.9	56.0
0.608850	44.7	9.000	N	19.8	11.3	56.0
0.935870	37.5	9.000	N	19.8	18.5	56.0
1.085890	37.5	9.000	N	19.8	18.5	56.0
1.136930	38.4	9.000	N	19.8	17.6	56.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.466000	23.6	9.000	N	19.8	23.0	46.6
0.514000	32.8	9.000	N	19.8	13.2	46.0
0.562000	26.3	9.000	N	19.8	19.7	46.0
0.610000	30.3	9.000	N	19.8	15.7	46.0
0.718000	26.5	9.000	N	19.8	19.5	46.0
0.942000	23.6	9.000	N	19.8	22.4	46.0

§15.205 & §15.209 & §15.407(B) (1),(4),(6),(7) – UNDESIRABLE EMISSION**Applicable Standard**

FCC §15.407 (b) (1), (4), (6), (7); §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.

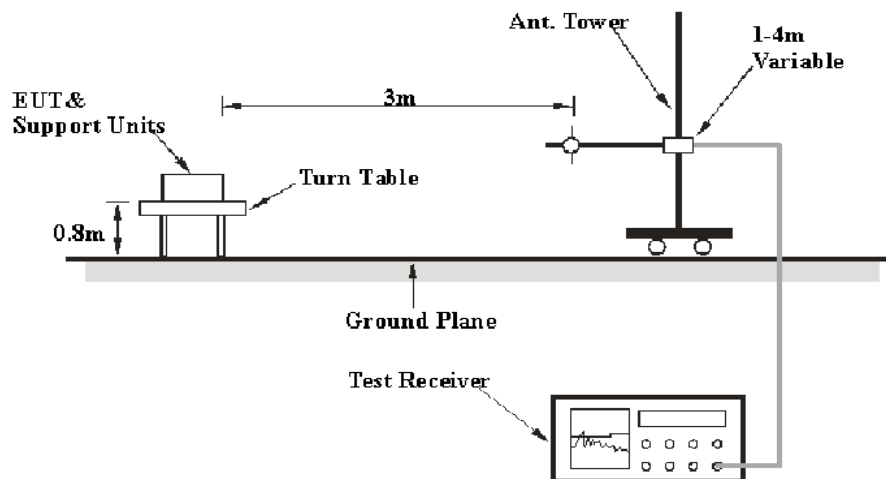
(4) For transmitters operating in the 5.725-5.85 GHz band:

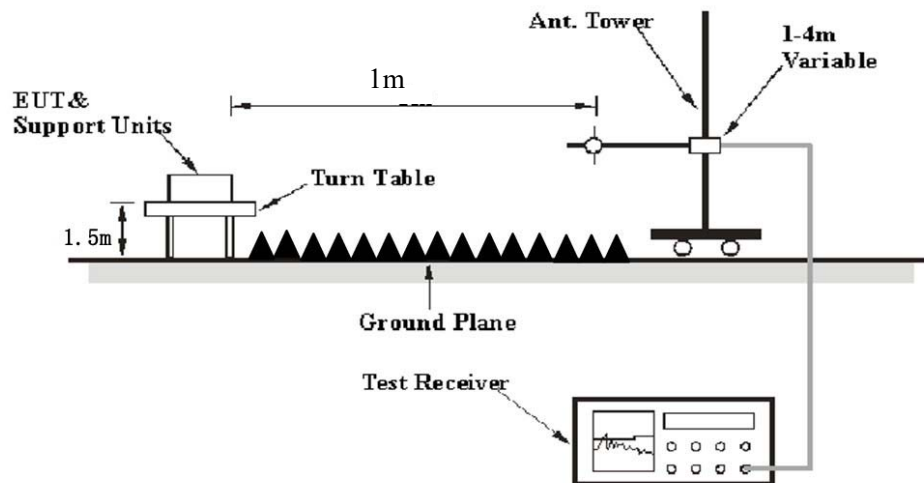
(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the 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.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

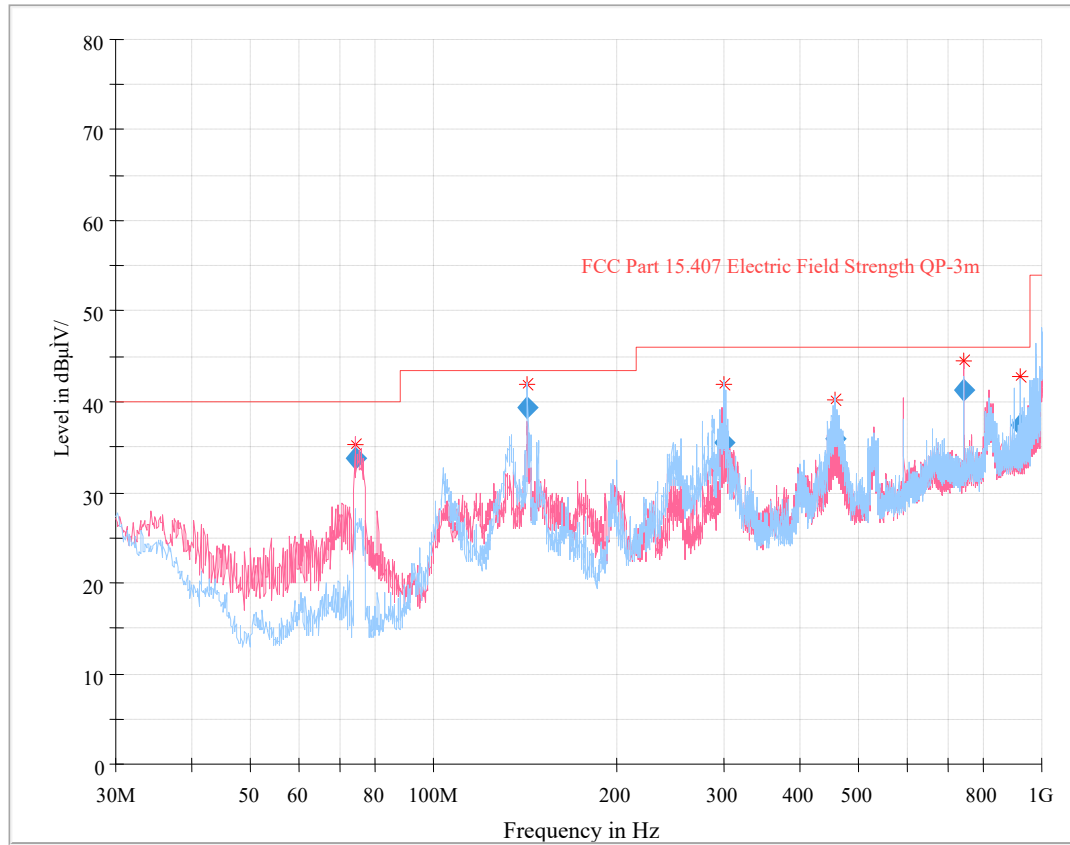
Test Data

Environmental Conditions

Temperature:	20.1~21 °C
Relative Humidity:	42~52 %
ATM Pressure:	101.1~101.2 kPa

The testing was performed by Kilroy Deng on 2021-03-12 for below 1GHz and Leven Gan on 2021-01-05 for above 1GHz.

EUT operation mode: Transmitting

30 MHz – 1 GHz: (the worst case is Wi-Fi 802.11n20Mode, 5745MHz)**Final Result**

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
74.271500	33.73	40.00	6.27	120.0	V	165.0	-10.4
142.830500	39.28	43.50	4.22	219.0	H	191.0	-4.9
300.573625	35.57	46.00	10.43	105.0	H	180.0	-3.9
457.712875	35.95	46.00	10.05	106.0	H	139.0	0.5
742.549625	41.20	46.00	4.80	100.0	V	220.0	5.3
924.817625	37.36	46.00	8.64	102.0	H	166.0	7.3

1 ~ 40 GHz:

Note: The test distance is 1m, so the correct factor from 3m to 1m is $20\log(3/1)=9.5\text{dB}$ which was added into the final limit.

5150-5250 MHz:

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				
802.11a									
5180 MHz									
5147.32	39.08	PK	103	2.1	H	38.36	77.44	83.5	6.06
5147.32	21.85	Ave.	103	2.1	H	38.36	60.21	63.5	3.29
5352.47	31.24	PK	185	1.3	H	39.09	70.33	83.5	13.17
5352.47	18.57	Ave.	185	1.3	H	39.09	57.66	63.5	5.84
10360.00	55.10	PK	309	1.3	H	17.42	72.52	77.7	5.18
5200 MHz									
10400.00	54.39	PK	210	2.2	H	17.52	71.91	77.7	5.79
5240 MHz									
5146.85	31.46	PK	299	2.0	H	38.36	69.82	83.5	13.68
5146.85	18.61	Ave.	299	2.0	H	38.36	56.97	63.5	6.53
5353.26	31.32	PK	172	1.5	H	39.09	70.41	83.5	13.09
5353.26	18.59	Ave.	172	1.5	H	39.09	57.68	63.5	5.82
10480.00	53.95	PK	148	2.1	H	17.25	71.20	77.7	6.50
802.11n20									
5180 MHz									
5149.73	39.29	PK	82	2.3	H	38.36	77.65	83.5	5.85
5149.73	20.78	Ave.	82	2.3	H	38.36	59.14	63.5	4.36
5351.46	31.53	PK	218	1.3	H	39.09	70.62	83.5	12.88
5351.46	18.24	Ave.	218	1.3	H	39.09	57.33	63.5	6.17
10360.00	53.54	PK	260	1.2	H	17.42	70.96	77.7	6.74
5200 MHz									
10400.00	52.97	PK	338	1.8	H	17.52	70.49	77.7	7.21
5240 MHz									
5147.53	31.75	PK	123	1.5	H	38.36	70.11	83.5	13.39
5147.53	18.25	Ave.	123	1.5	H	38.36	56.61	63.5	6.89
5352.68	31.68	PK	317	2.1	H	39.09	70.77	83.5	12.73
5352.68	18.30	Ave.	317	2.1	H	39.09	57.39	63.5	6.11
10480.00	52.44	PK	133	2.2	H	17.25	69.69	77.7	8.01

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				
802.11n40									
5190 MHz									
5149.96	31.75	PK	286	2.0	H	38.36	70.11	83.5	13.39
5149.96	20.04	Ave.	286	2.0	H	38.36	58.40	63.5	5.10
5354.16	31.57	PK	43	2.5	H	39.09	70.66	83.5	12.84
5354.16	18.29	Ave.	43	2.5	H	39.09	57.38	63.5	6.12
10380.00	46.15	PK	347	2.5	H	17.42	63.57	77.7	14.13
5230 MHz									
5146.68	31.81	PK	309	2.4	H	38.36	70.17	83.5	13.33
5146.68	18.22	Ave.	309	2.4	H	38.36	56.58	63.5	6.92
5352.75	31.89	PK	137	2.3	H	39.09	70.98	83.5	12.52
5352.75	18.19	Ave.	137	2.3	H	39.09	57.28	63.5	6.22
10460.00	45.77	PK	135	2.1	H	17.15	62.92	77.7	14.78
802.11ac20									
5180 MHz									
5149.95	37.82	PK	188	1.8	H	38.36	76.18	83.5	7.32
5149.95	21.17	Ave.	188	1.8	H	38.36	59.53	63.5	3.97
5354.27	32.04	PK	90	2.5	H	39.09	71.13	83.5	12.37
5354.27	18.37	Ave.	90	2.5	H	39.09	57.46	63.5	6.04
10360.00	54.38	PK	64	2.1	H	17.42	71.80	77.7	5.90
5200 MHz									
10400.00	53.76	PK	6	1.2	H	17.52	71.28	77.7	6.42
5240 MHz									
5147.63	32.23	PK	67	1.8	H	38.36	70.59	83.5	12.91
5147.63	18.33	Ave.	67	1.8	H	38.36	56.69	63.5	6.81
5352.26	31.89	PK	314	1.1	H	39.09	70.98	83.5	12.52
5352.26	18.31	Ave.	314	1.1	H	39.09	57.40	63.5	6.10
10480.00	53.23	PK	146	2.2	H	17.25	70.48	77.7	7.22
802.11ac40									
5190 MHz									
5148.65	37.42	PK	182	1.1	H	38.36	75.78	83.5	7.72
5148.65	20.96	Ave.	182	1.1	H	38.36	59.32	63.5	4.18
5353.22	32.18	PK	30	1.5	H	39.09	71.27	83.5	12.23
5353.22	18.27	Ave.	30	1.5	H	39.09	57.36	63.5	6.14
10380.00	45.58	PK	330	2.0	H	17.42	63.00	77.7	14.70
5230 MHz									
5146.67	32.28	PK	237	2.1	H	38.36	70.64	83.5	12.86
5146.67	18.24	Ave.	237	2.1	H	38.36	56.60	63.5	6.90
5350.75	32.34	PK	87	2.5	H	39.09	71.43	83.5	12.07
5350.75	18.29	Ave.	87	2.5	H	39.09	57.38	63.5	6.12
10460.00	46.23	PK	53	1.4	H	17.15	63.38	77.7	14.32

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)				
802.11ac80									
5210 MHz									
5147.29	37.33	PK	356	2.5	H	38.36	75.69	83.5	7.81
5147.29	21.56	Ave.	356	2.5	H	38.36	59.92	63.5	3.58
5350.28	33.24	PK	187	1.7	H	39.09	72.33	83.5	11.17
5350.28	18.37	Ave.	187	1.7	H	39.09	57.46	63.5	6.04
10420.00	45.06	PK	105	2.1	H	17.52	62.58	77.7	15.12

5725-5850 MHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11a									
5745 MHz									
5641.64	32.82	PK	116	2.3	H	39.46	72.28	77.7	5.42
5682.82	31.87	PK	173	1.4	H	39.49	71.36	101.99	30.63
5719.23	34.11	PK	6	2.4	H	39.49	73.60	120.08	46.48
5723.60	43.83	PK	171	1.0	H	39.49	83.32	128.51	45.19
11490.00	53.48	PK	263	1.4	H	17.47	70.95	83.5	12.55
11490.00	38.69	Ave.	263	1.4	H	17.47	56.16	63.5	7.34
5785 MHz									
11570.00	52.94	PK	287	1.5	H	17.51	70.45	83.5	13.05
11570.00	38.19	Ave.	287	1.5	H	17.51	55.70	63.5	7.80
5825 MHz									
5851.73	33.61	PK	210	2.5	H	39.87	73.48	127.76	54.28
5864.88	33.43	PK	118	1.7	H	39.87	73.30	117.53	44.23
5920.26	33.65	PK	287	1.2	H	39.97	73.62	81.21	7.59
5933.07	34.70	PK	319	1.1	H	39.97	74.67	77.7	3.03
11650.00	52.26	PK	134	2.5	H	16.18	68.44	83.5	15.06
11650.00	37.95	Ave.	134	2.5	H	16.18	54.13	63.5	9.37
802.11n20									
5745 MHz									
5620.37	32.11	PK	358	2.4	H	39.46	71.57	77.7	6.13
5695.19	33.27	PK	180	2.1	H	39.49	72.76	111.14	38.38
5719.96	34.28	PK	211	2.1	H	39.49	73.77	120.29	46.52
5723.87	44.17	PK	163	2.0	H	39.49	83.66	129.12	45.46
11490.00	52.99	PK	142	2.3	H	17.47	70.46	83.5	13.04
11490.00	38.54	Ave.	142	2.3	H	17.47	56.01	63.5	7.49
5785 MHz									
11570.00	52.89	PK	267	2.0	H	17.51	70.40	83.5	13.10
11570.00	38.16	Ave.	267	2.0	H	17.51	55.67	63.5	7.83
5825 MHz									
5850.48	34.86	PK	157	2.4	H	39.87	74.73	130.61	55.88
5861.15	34.72	PK	189	2.0	H	39.87	74.59	118.58	43.99
5882.78	34.99	PK	94	1.2	H	39.87	74.86	108.94	34.08
5959.55	34.04	PK	154	1.9	H	39.84	73.88	77.7	3.82
11650.00	52.64	PK	271	1.8	H	16.18	68.82	83.5	14.68
11650.00	38.05	Ave.	271	1.8	H	16.18	54.23	63.5	9.27

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11n40									
5755 MHz									
5628.55	33.39	PK	83	1.2	H	39.46	72.85	77.7	4.85
5699.46	33.95	PK	176	2.3	H	39.49	73.44	114.3	40.86
5718.83	42.07	PK	171	1.5	H	39.49	81.56	119.97	38.41
5723.63	43.44	PK	274	1.8	H	39.49	82.93	128.58	45.65
11510.00	50.45	PK	20	2.4	H	17.47	67.92	83.5	15.58
11510.00	38.42	Ave.	20	2.4	H	17.47	55.89	63.5	7.61
5795 MHz									
5850.79	34.42	PK	297	1.7	H	39.87	74.29	129.9	55.61
5861.24	33.41	PK	185	1.1	H	39.87	73.28	118.55	45.27
5894.86	34.68	PK	66	1.7	H	39.87	74.55	100	25.45
5929.96	33.40	PK	71	2.1	H	39.97	73.37	77.7	4.33
11590.00	50.39	PK	173	2.4	H	17.51	67.90	83.5	15.60
11590.00	37.94	Ave.	173	2.4	H	17.51	55.45	63.5	8.05
802.11ac20									
5745 MHz									
5619.36	31.95	PK	336	2.0	H	39.46	71.41	77.7	6.29
5665.59	32.37	PK	316	1.0	H	39.49	71.86	89.24	17.38
5719.06	32.79	PK	72	2.1	H	39.49	72.28	120.04	47.76
5724.19	43.56	PK	45	1.4	H	39.49	83.05	129.85	46.80
11490.00	53.63	PK	185	1.8	H	17.47	71.10	83.5	12.40
11490.00	38.71	Ave.	185	1.8	H	17.47	56.18	63.5	7.32
5785 MHz									
11570.00	52.96	PK	184	2.4	H	17.51	70.47	83.5	13.03
11570.00	38.24	Ave.	184	2.4	H	17.51	55.75	63.5	7.75
5825 MHz									
5854.74	34.05	PK	87	1.8	H	39.87	73.92	120.89	46.97
5869.17	33.23	PK	278	2.4	H	39.87	73.10	116.33	43.23
5901.60	33.37	PK	126	2.4	H	39.87	73.24	95.2	21.96
5951.81	34.66	PK	48	1.0	H	39.84	74.50	77.7	3.20
11650.00	52.71	PK	355	1.6	H	16.18	68.89	83.5	14.61
11650.00	37.98	Ave.	355	1.6	H	16.18	54.16	63.5	9.34

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
802.11ac40									
5755 MHz									
5649.24	33.01	PK	264	2.0	H	39.46	72.47	77.7	5.23
5653.65	32.06	PK	243	1.9	H	39.49	71.55	80.4	8.85
5719.12	42.24	PK	65	1.4	H	39.49	81.73	120.05	38.32
5723.93	42.86	PK	240	1.8	H	39.49	82.35	129.26	46.91
11510.00	50.26	PK	10	1.1	H	17.47	67.73	83.5	15.77
11510.00	38.17	Ave.	0	1.1	H	17.47	55.64	63.5	7.86
5795 MHz									
5850.45	32.70	PK	273	2.1	H	39.87	72.57	130.67	58.10
5860.49	34.82	PK	110	1.3	H	39.87	74.69	118.76	44.07
5916.21	34.22	PK	310	1.6	H	39.87	74.09	84.2	10.11
5968.67	34.35	PK	38	1.7	H	39.84	74.19	77.7	3.51
11590.00	49.38	PK	329	1.6	H	17.51	66.89	83.5	16.61
11590.00	37.89	Ave.	329	1.6	H	17.51	55.40	63.5	8.10
802.11ac80									
5775 MHz									
5623.26	31.51	PK	347	1.4	H	39.46	70.97	77.7	6.73
5694.68	36.66	PK	229	1.5	H	39.49	76.15	110.76	34.61
5719.75	37.21	PK	62	1.3	H	39.49	76.70	120.23	43.53
5722.06	38.63	PK	190	1.6	H	39.49	78.12	125	46.88
5850.68	36.48	PK	198	1.2	H	39.87	76.35	130.15	53.80
5856.03	34.54	PK	56	1.3	H	39.87	74.41	120.01	45.60
5916.35	33.56	PK	270	1.5	H	39.87	73.43	84.1	10.67
5957.31	33.98	PK	229	1.4	H	39.84	73.82	77.7	3.88
11550.00	48.92	PK	357	1.6	H	17.51	66.43	83.5	17.07
11550.00	36.10	Ave.	357	1.6	H	17.51	53.61	63.5	9.89

Note:

Corrected Amplitude = Corrected Factor + Reading

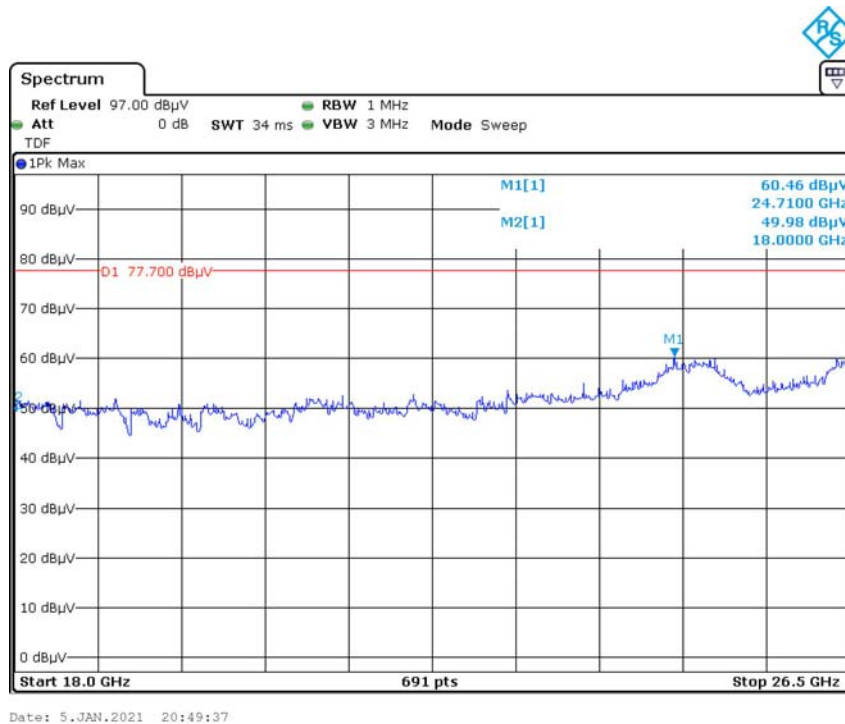
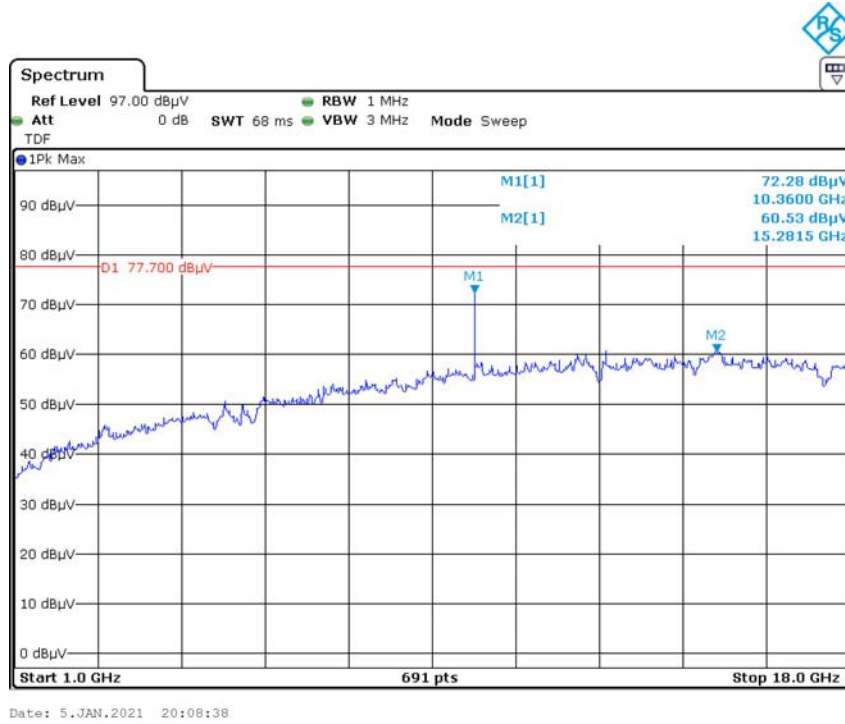
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor

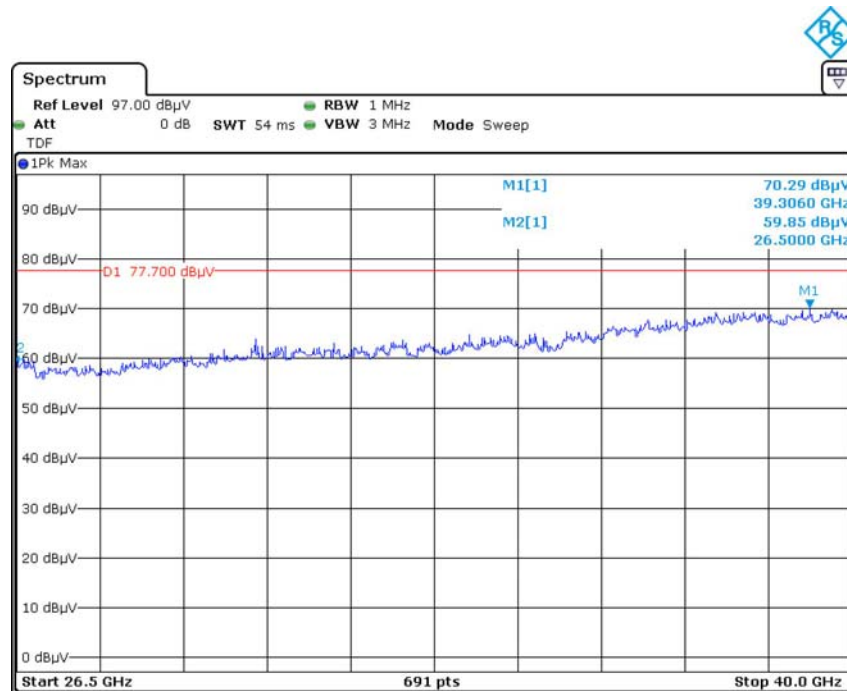
Margin = Limit- Corr. Amplitude

All other spurious emissions are 20 dB below the limit or are on the system noise floor level.

Peak

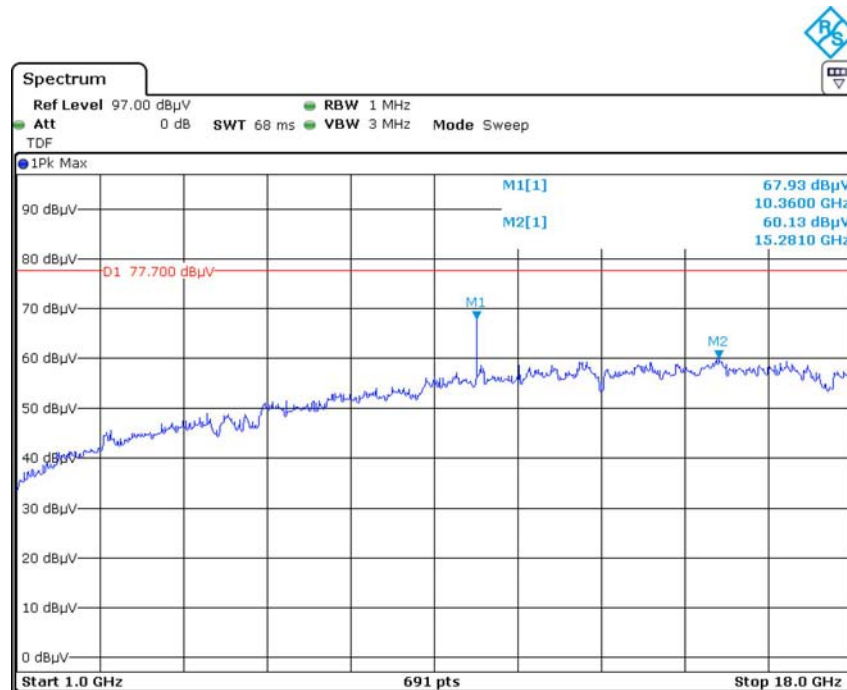
Pre-scan with 802.11a 5180MHz Horizontal



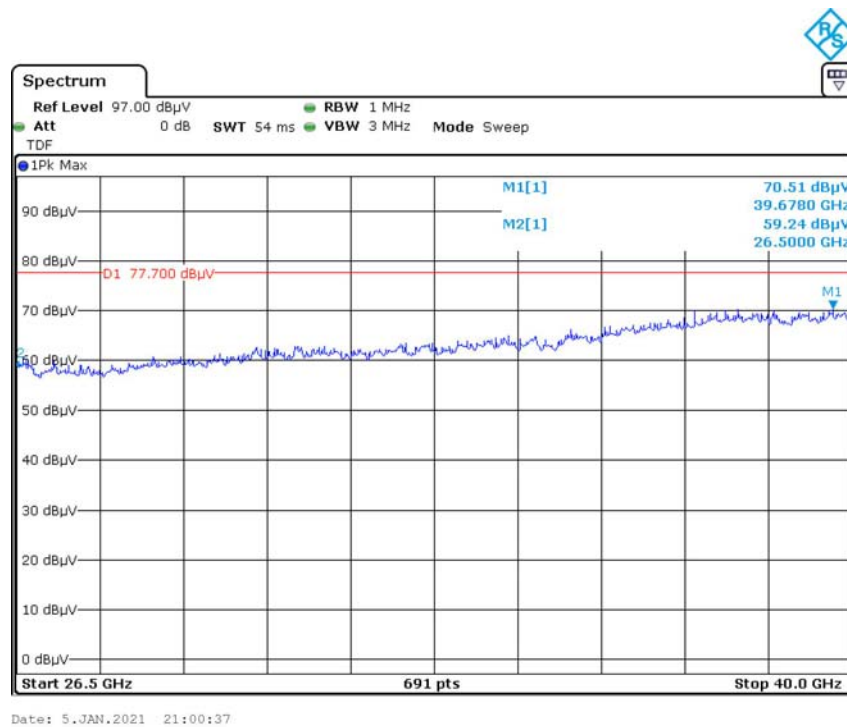
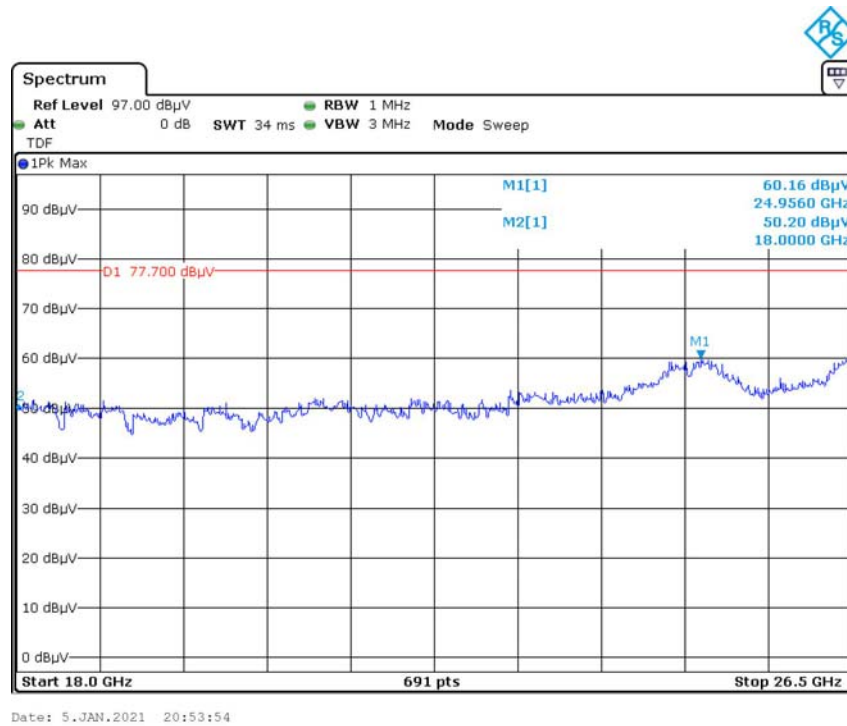


Date: 5.JAN.2021 20:57:17

Vertical



Date: 5.JAN.2021 20:19:05



FCC §15.407(1), (5),(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

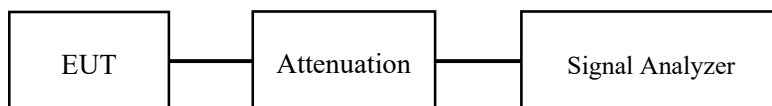
1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 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:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao from 2021-01-06 to 2021-04-19.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a)(1) (3) – CONDUCTED TRANSMITTER OUTPUT POWER

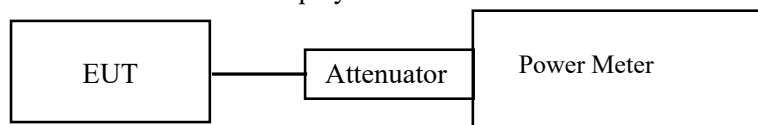
Applicable Standard

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 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

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.
3. Add a correction factor to the display.



Test Data**Environmental Conditions**

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

The testing was performed by Bravos Zhao from 2021-01-06 to 2021-01-07.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

FCC §15.407(a) (1) (3) - 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 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

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

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

Test Data**Environmental Conditions**

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

The testing was performed by Bravos Zhao from 2021-01-06 to 2021-01-07.

EUT operation mode: Transmitting

Test Result: Pass

Please refer to the Appendix.

APPENDIX

Appendix A1: Emission Bandwidth Test Result

TestMode	Antenna	Channel	26db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	25.560	---	PASS
		5200	25.240	---	PASS
		5240	26.160	---	PASS
11N20SISO	Ant1	5180	21.160	---	PASS
		5200	21.200	---	PASS
		5240	22.280	---	PASS
11N40SISO	Ant1	5190	42.640	---	PASS
		5230	42.400	---	PASS
11AC20SISO	Ant1	5180	21.400	---	PASS
		5200	22.240	---	PASS
		5240	23.240	---	PASS
11AC40SISO	Ant1	5190	42.880	---	PASS
		5230	42.640	---	PASS
11AC80SISO	Ant1	5210	85.120	---	PASS

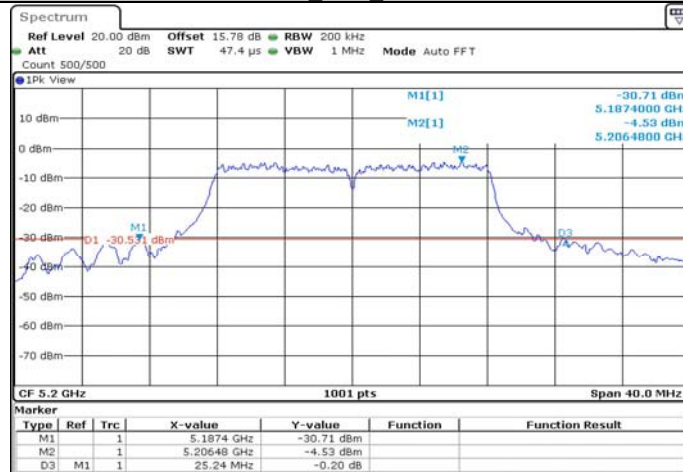
Test Graphs

11A_Ant1_5180



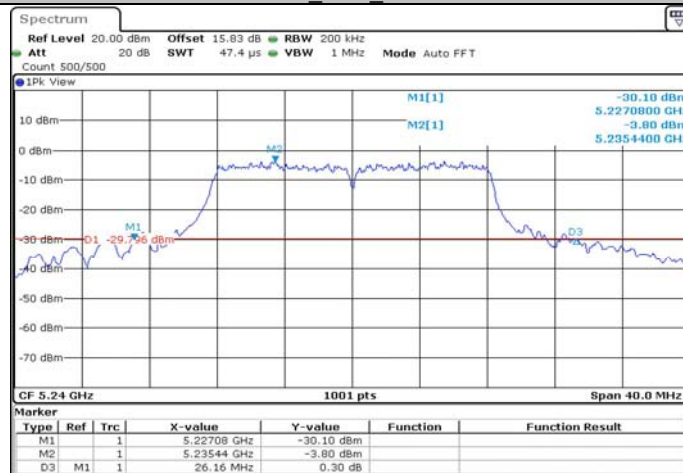
Date: 7, JAN, 2021 09:19:58

11A_Ant1_5200

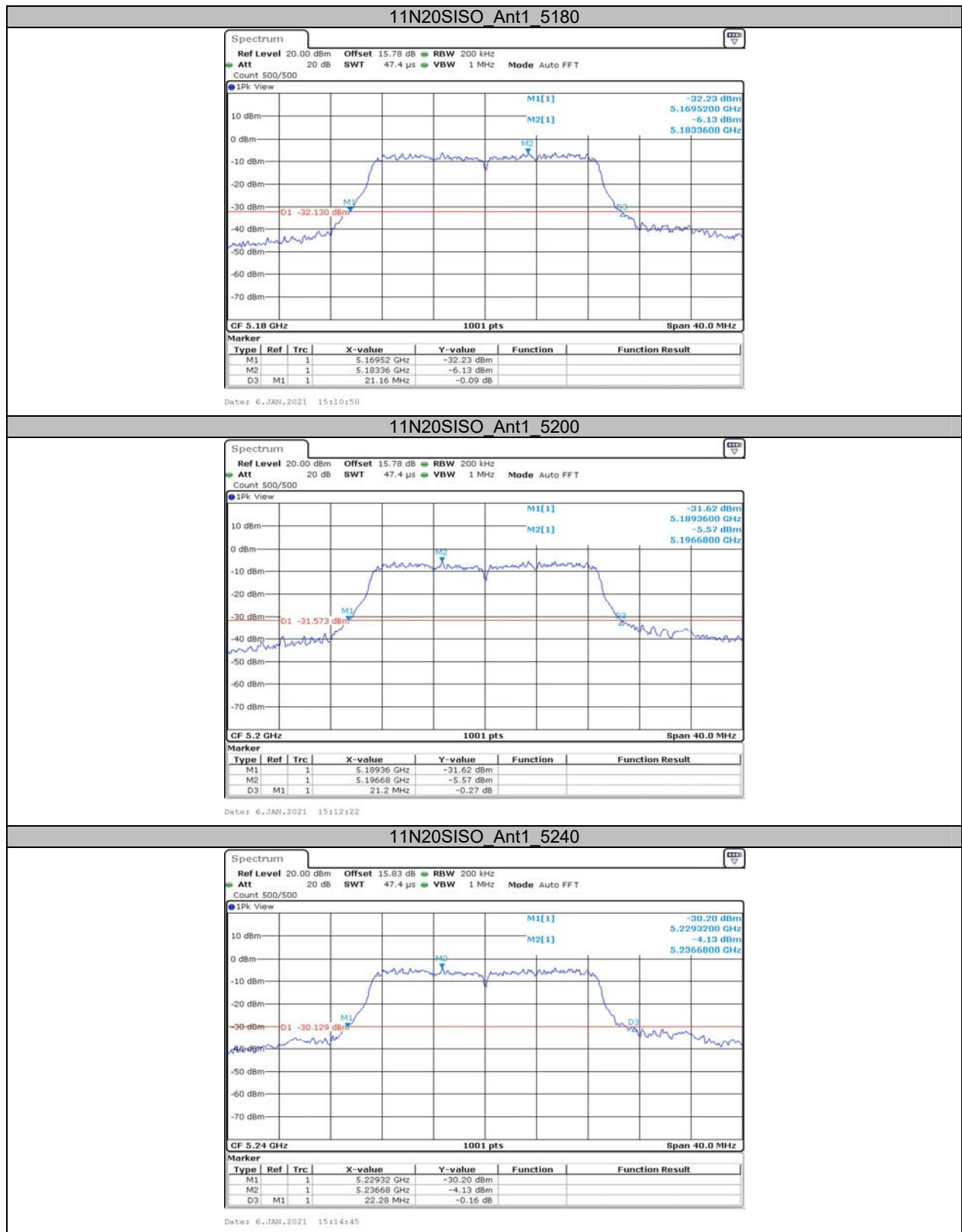


Date: 6, JAN, 2021 14:42:57

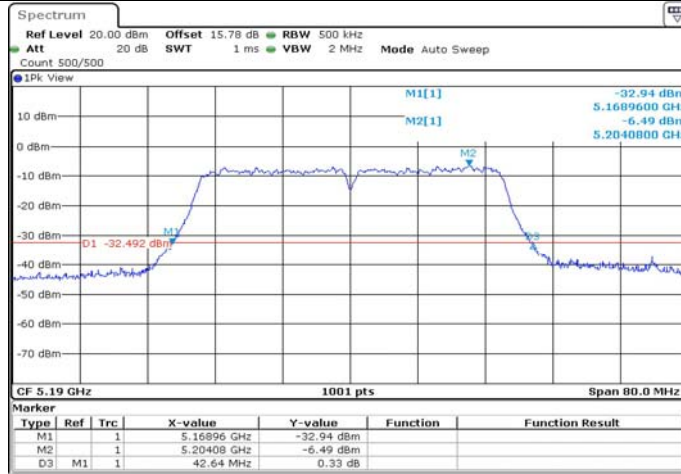
11A_Ant1_5240



Date: 6, JAN, 2021 14:57:31

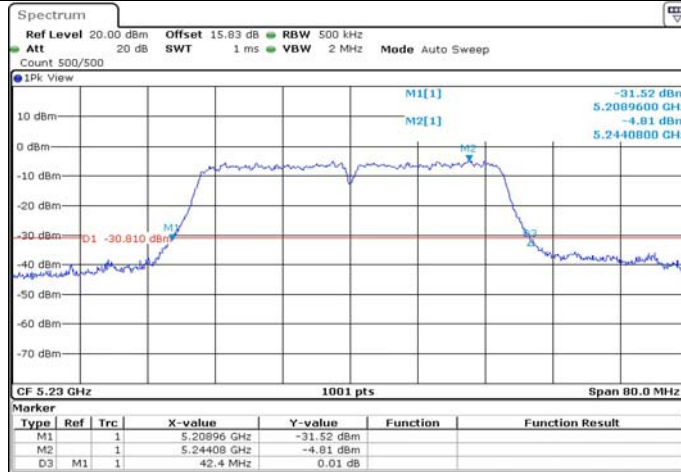


11N40SISO_Ant1_5190



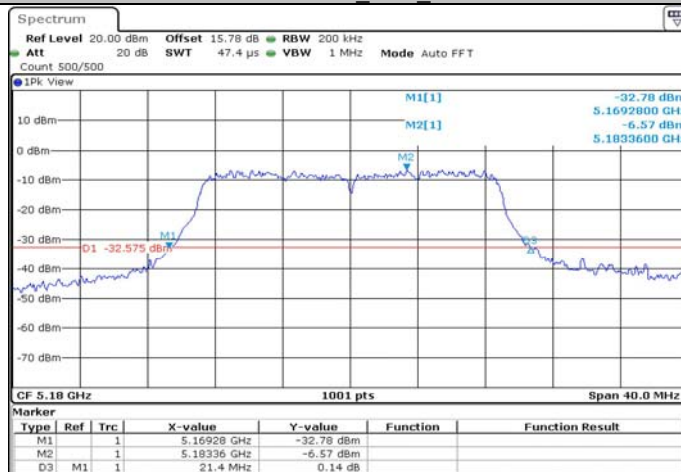
Date: 6.JAN.2021 16:43:17

11N40SISO_Ant1_5230



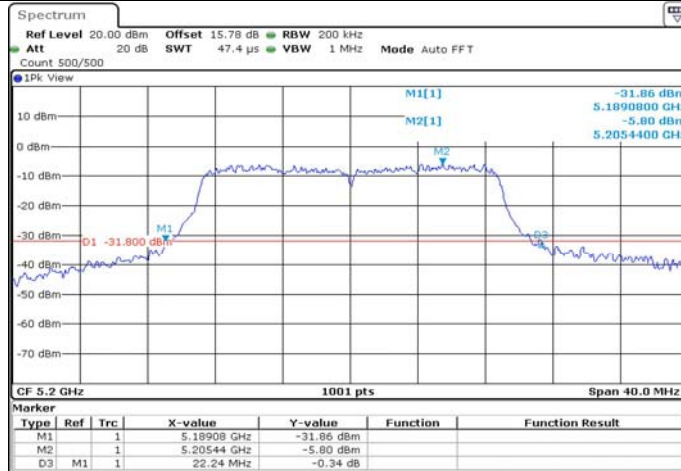
Date: 6.JAN.2021 16:42:38

11AC20SISO_Ant1_5180



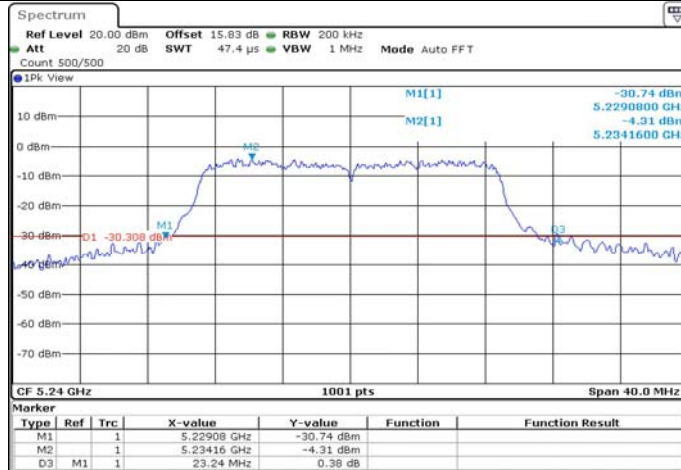
Date: 6.JAN.2021 16:53:10

11AC20SISO_Ant1_5200



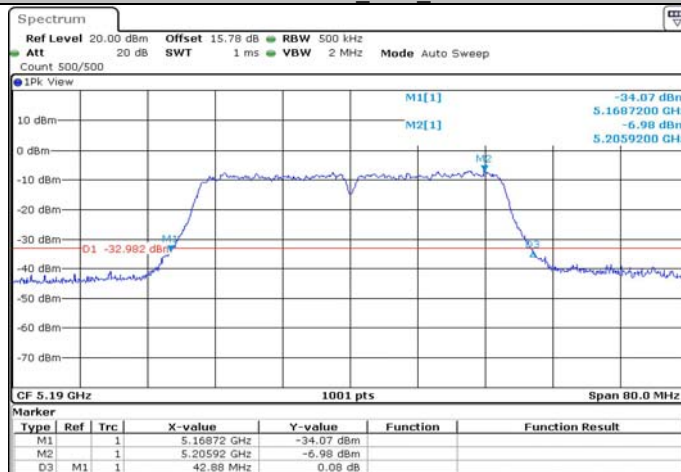
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11AC20SISO_Ant1_5240

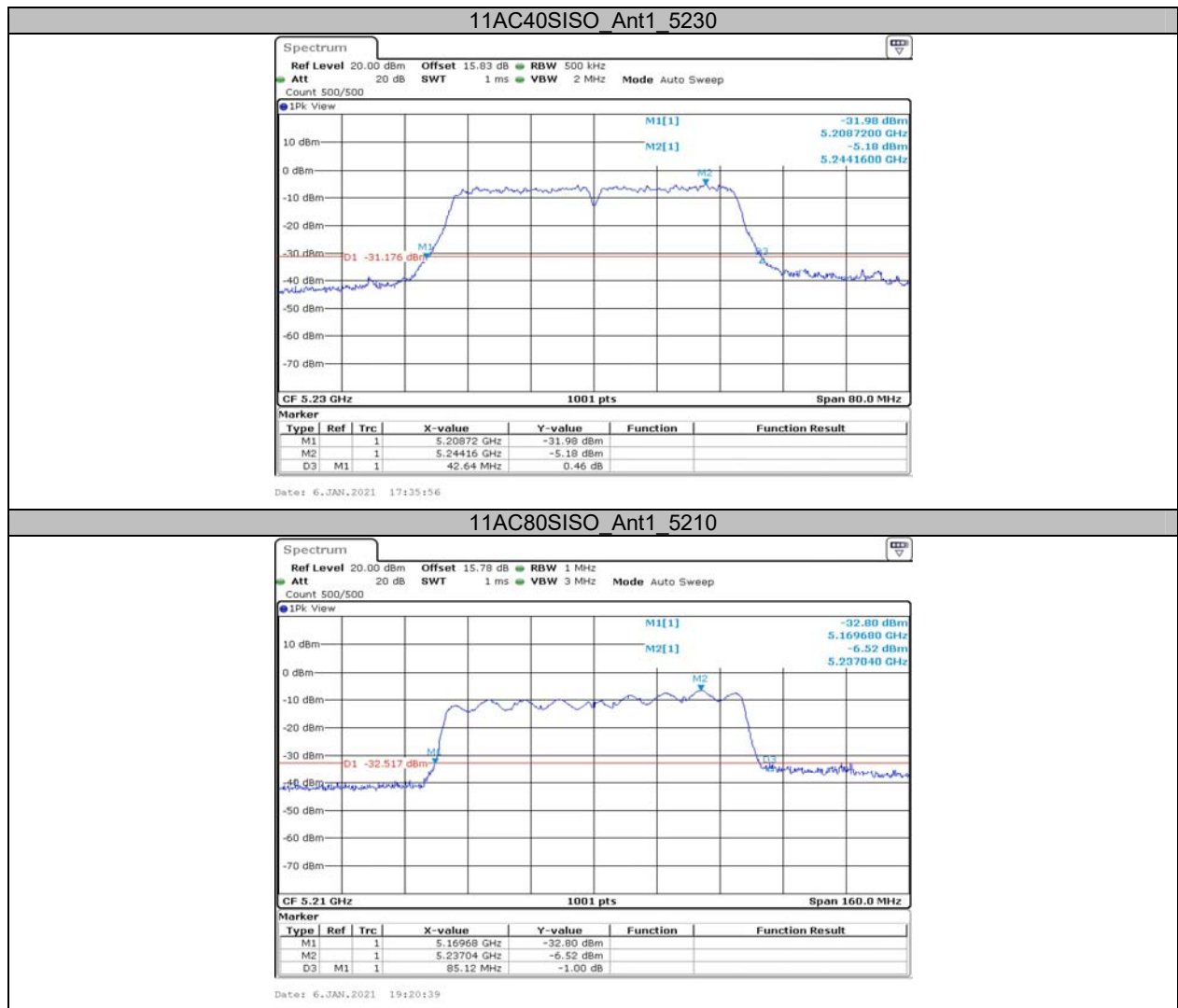


Date: 6.JAN.2021 17:01:07

11AC40SISO_Ant1_5190



Date: 6.JAN.2021 17:33:25



Appendix A2: Occupied channel bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.261	---	PASS
		5200	21.179	---	PASS
		5240	19.301	---	PASS
		5745	19.94	---	PASS
		5785	19.341	---	PASS
		5825	18.422	---	PASS
11N20SISO	Ant1	5180	19.66	---	PASS
		5200	21.778	---	PASS
		5240	19.101	---	PASS
		5745	19.86	---	PASS
		5785	21.499	---	PASS
		5825	19.82	---	PASS
11N40SISO	Ant1	5190	37.163	---	PASS
		5230	37.562	---	PASS
		5755	37.403	---	PASS
		5795	37.323	---	PASS
11AC20SISO	Ant1	5180	18.302	---	PASS
		5200	18.302	---	PASS
		5240	19.74	---	PASS
		5745	19.82	---	PASS
		5785	19.7	---	PASS
		5825	18.941	---	PASS
11AC40SISO	Ant1	5190	37.243	---	PASS
		5230	37.882	---	PASS
		5755	37.403	---	PASS
		5795	37.163	---	PASS
11AC80SISO	Ant1	5210	77.363	---	PASS
		5775	78.482	---	PASS

Test Graphs

11A_Ant1_5180



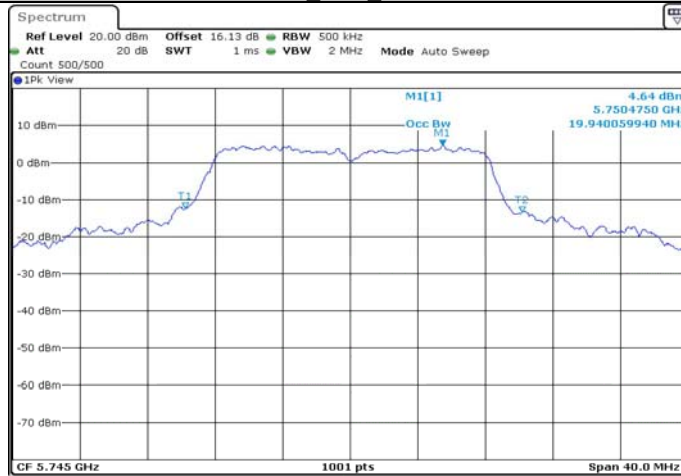
11A_Ant1_5200



11A_Ant1_5240

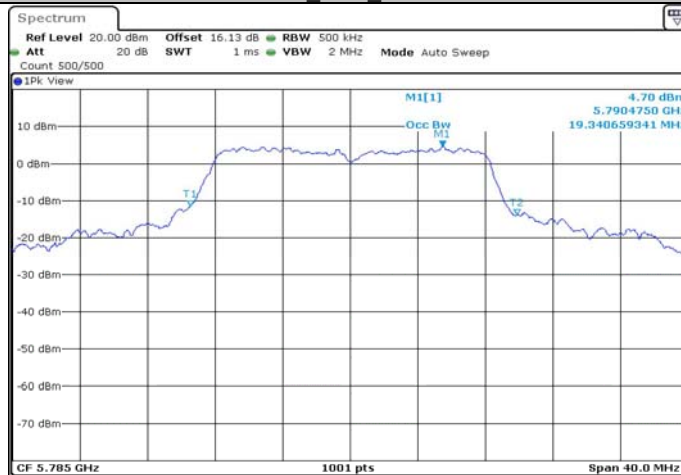


11A_Ant1_5745



Date: 6.JAN.2021 15:04:17

11A_Ant1_5785

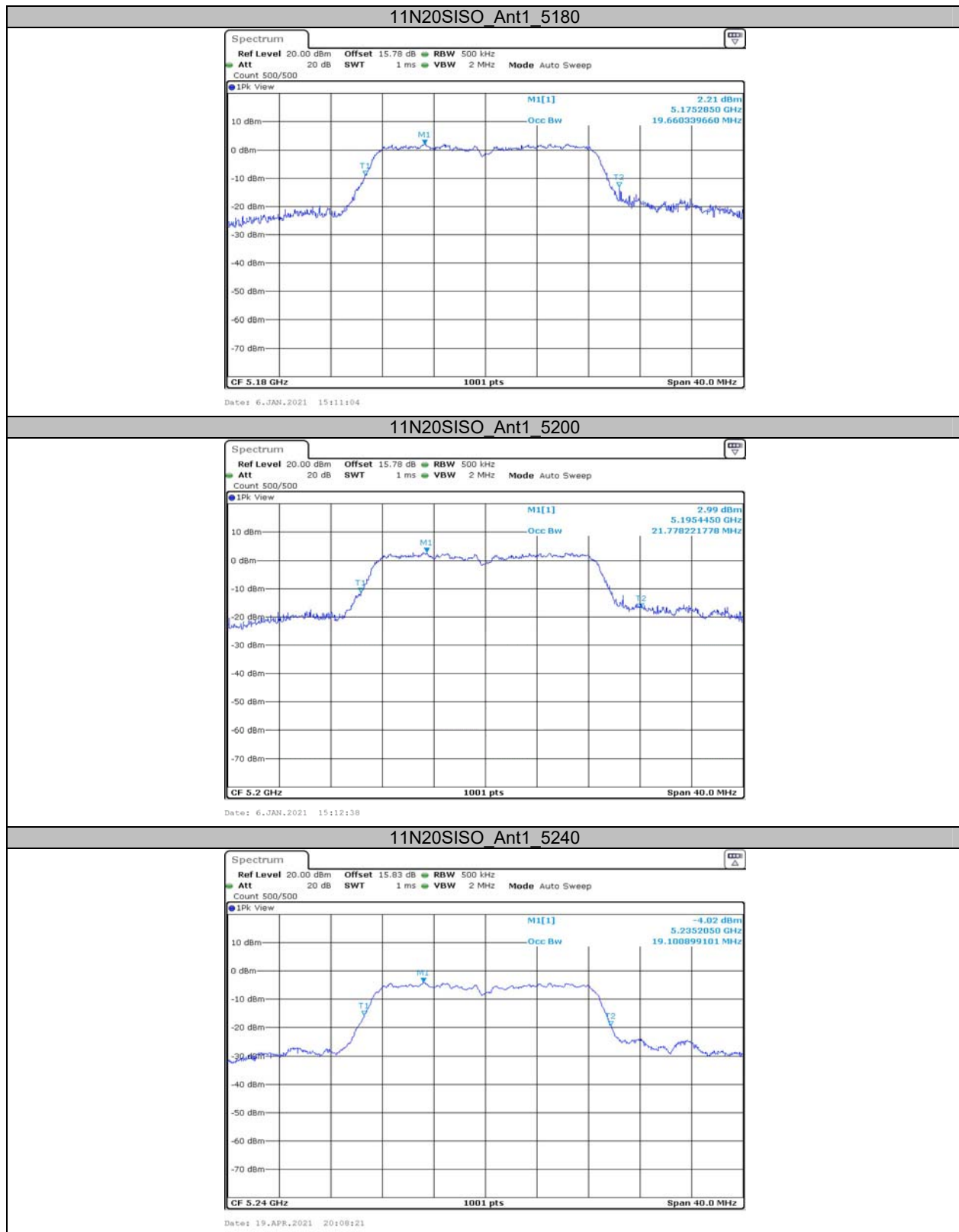


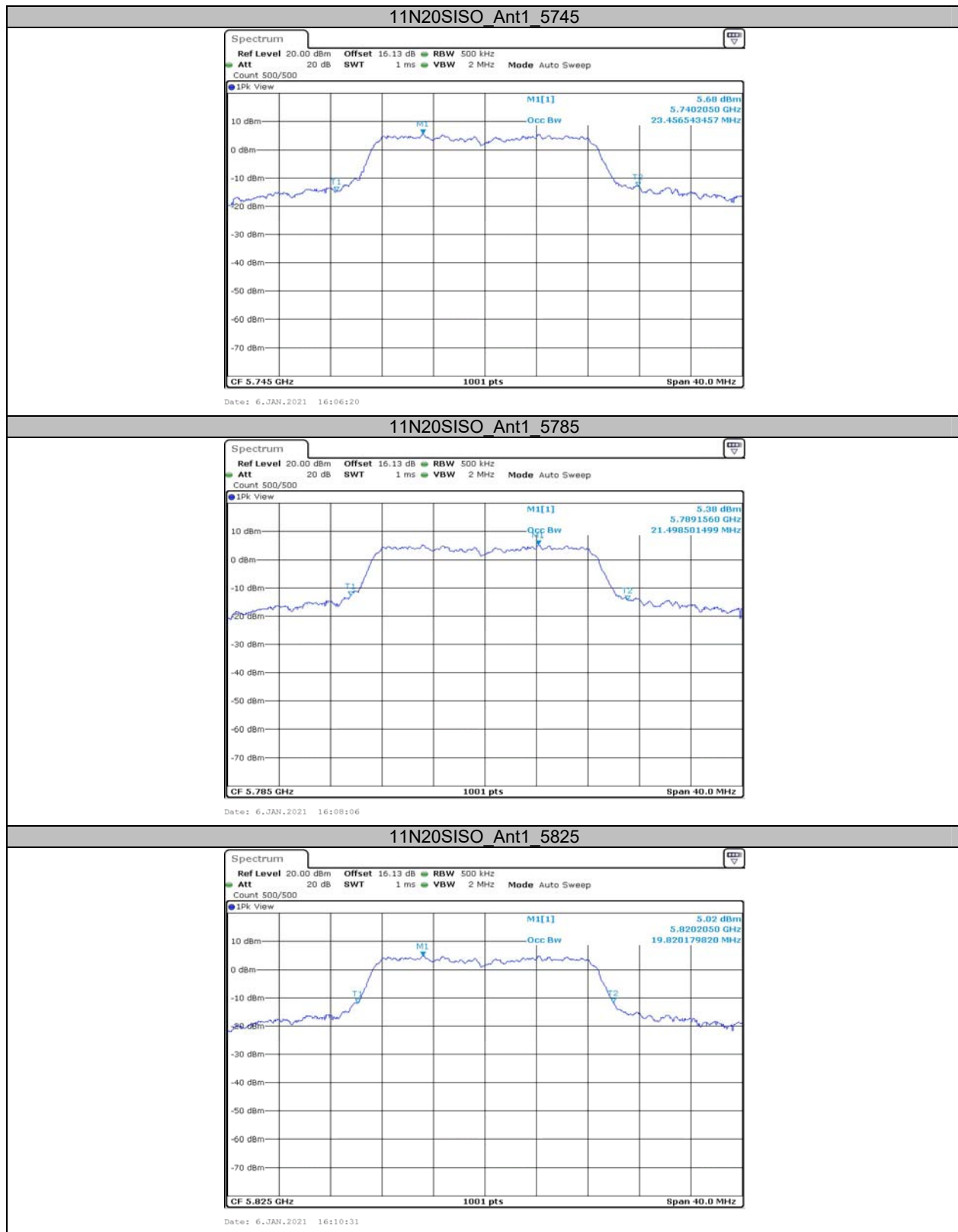
Date: 6.JAN.2021 15:06:07

11A_Ant1_5825



Date: 6.JAN.2021 15:08:47





11N40SISO_Ant1_5190



Date: 6.JAN.2021 16:36:21

11N40SISO_Ant1_5230

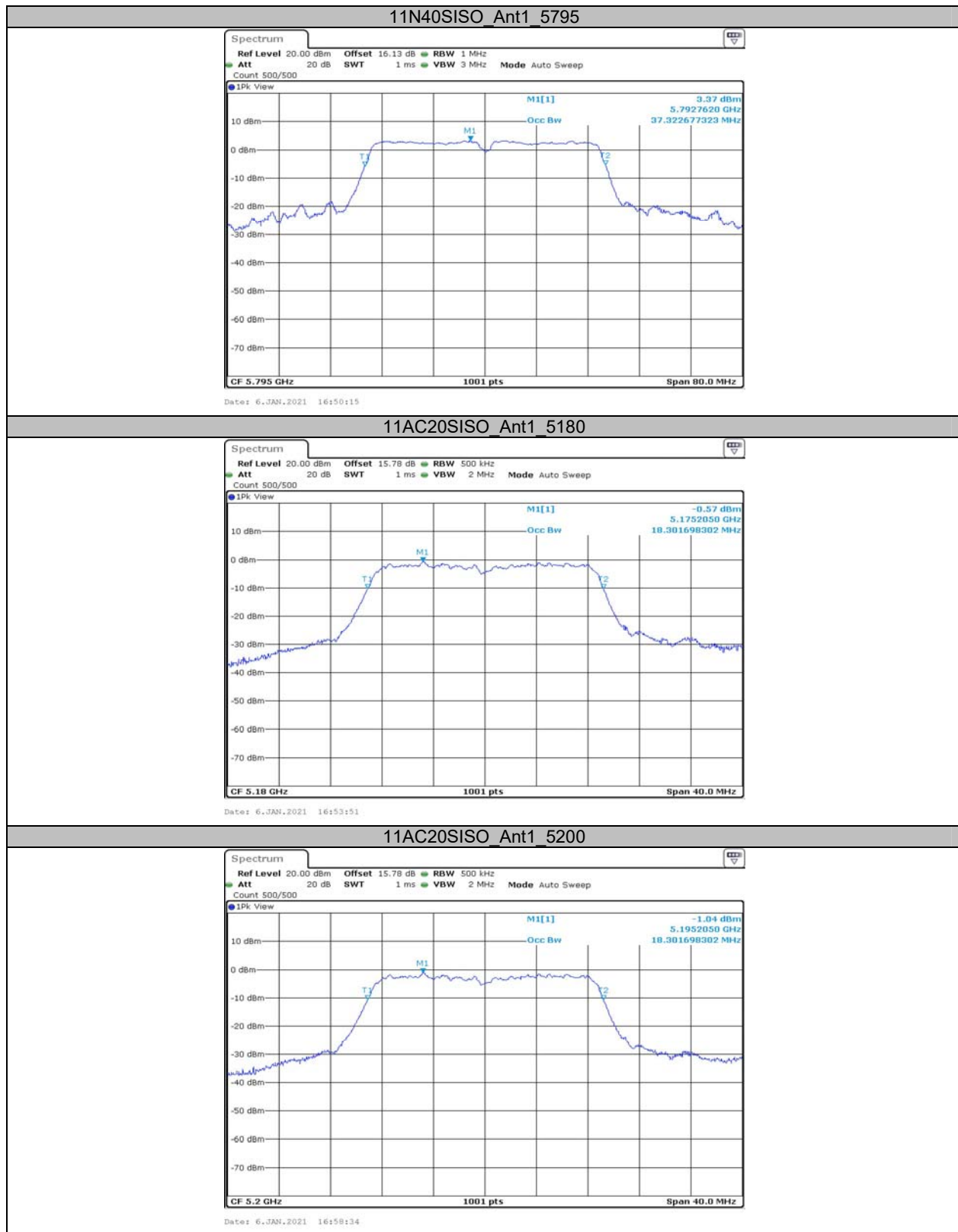


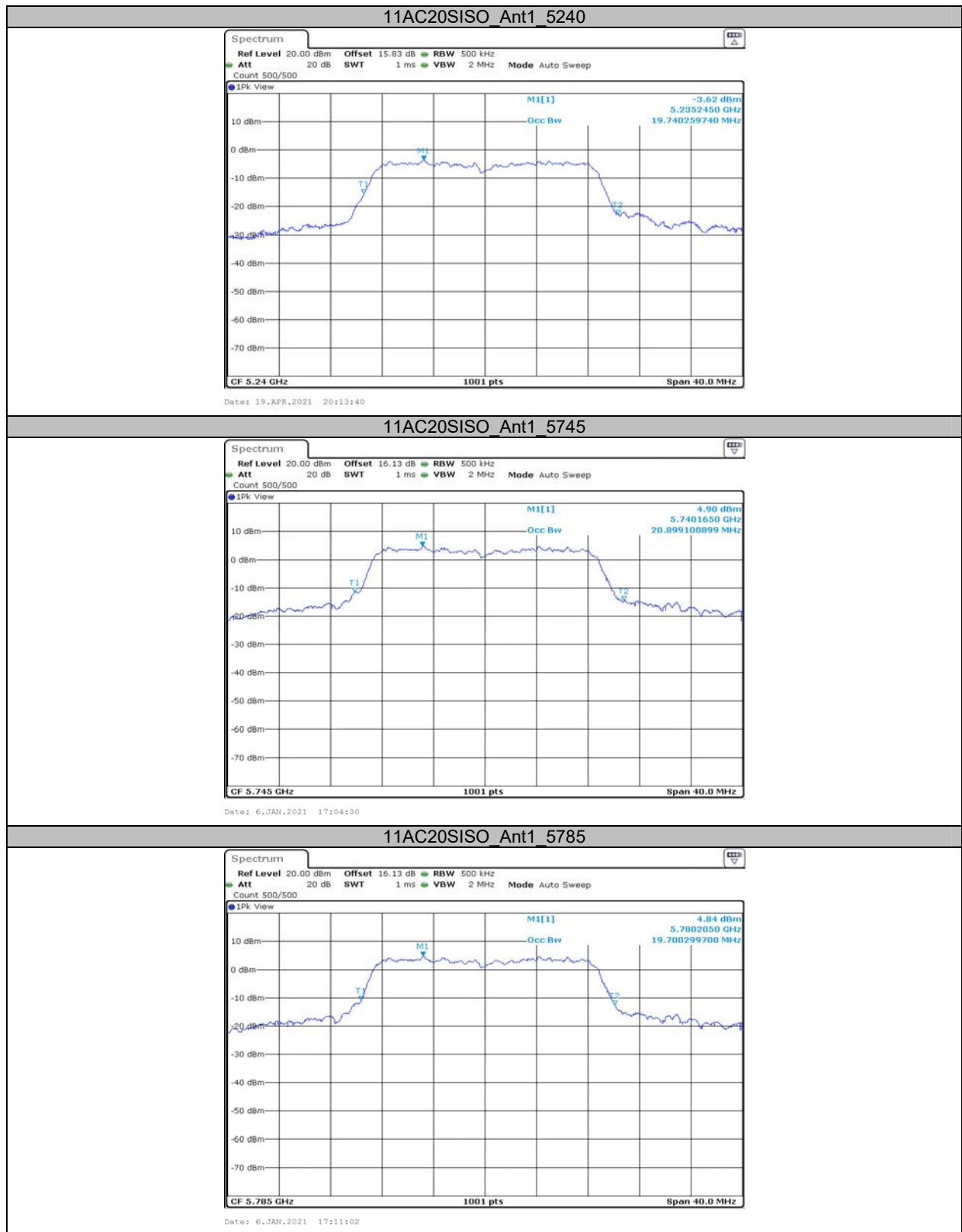
Date: 6.JAN.2021 16:43:54

11N40SISO_Ant1_5755



Date: 6.JAN.2021 16:48:13





11AC20SISO_Ant1_5825

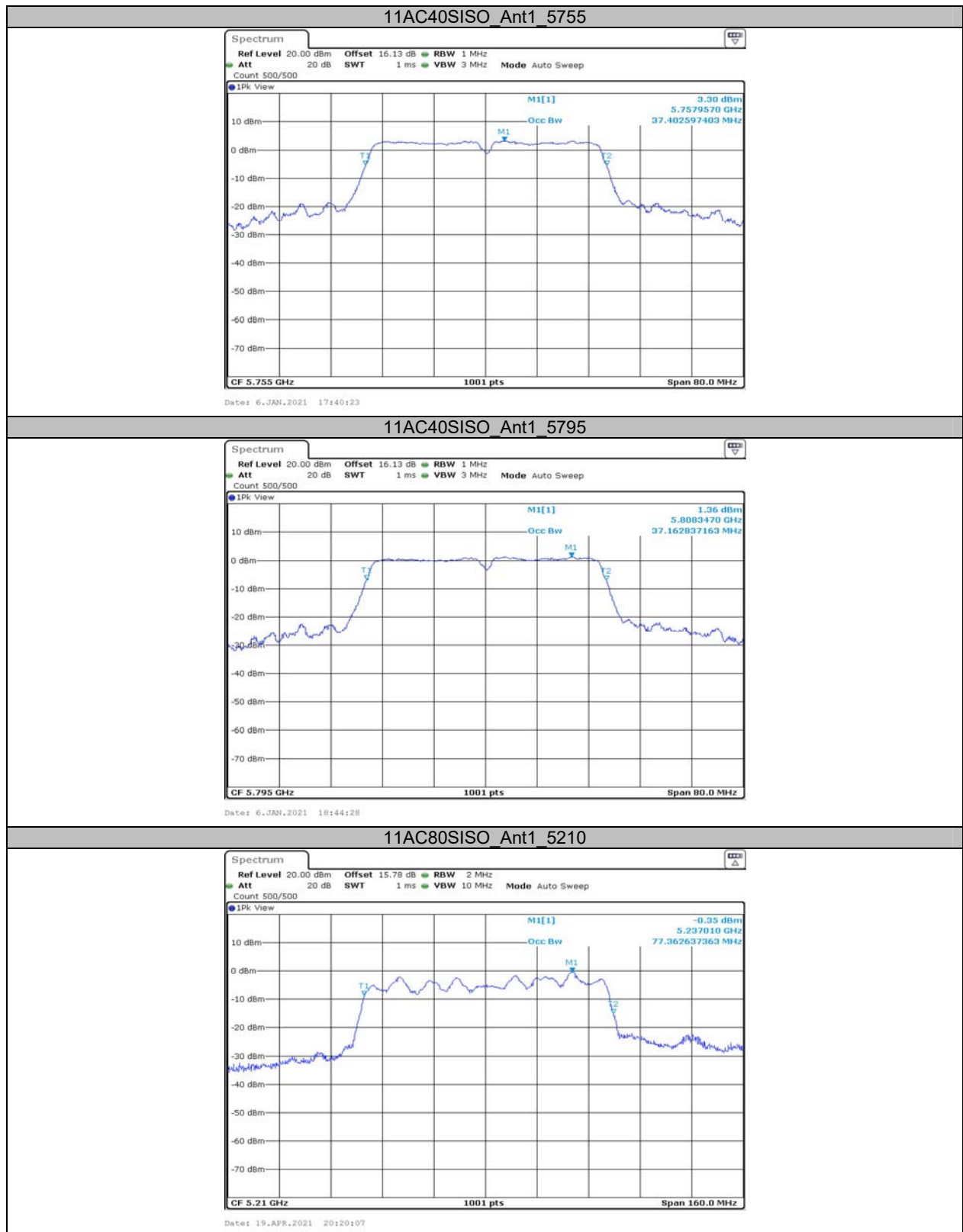


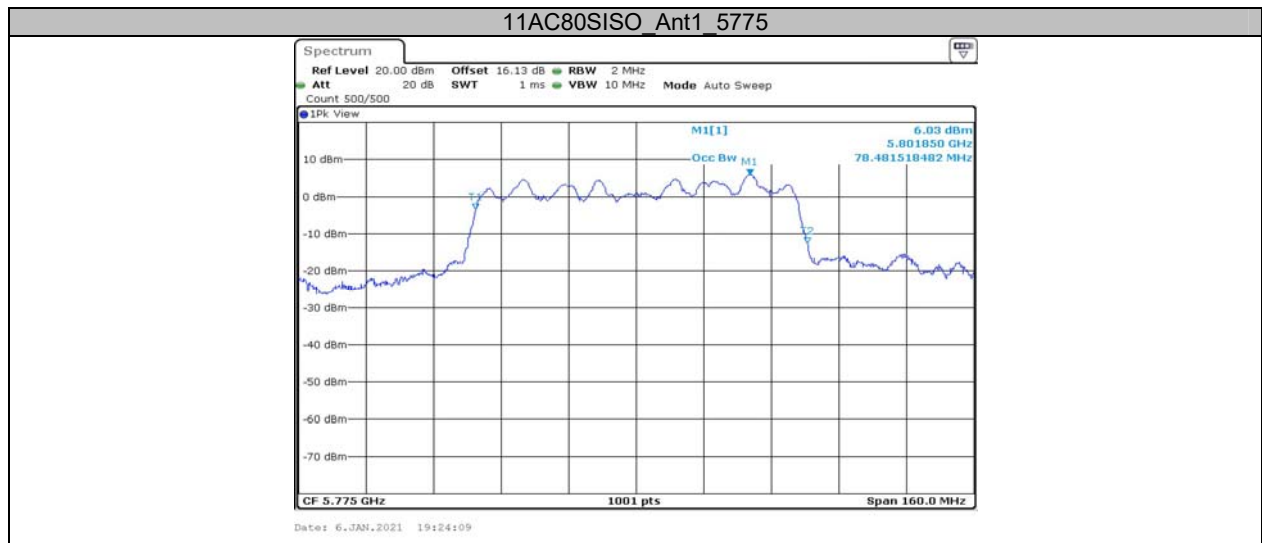
11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230





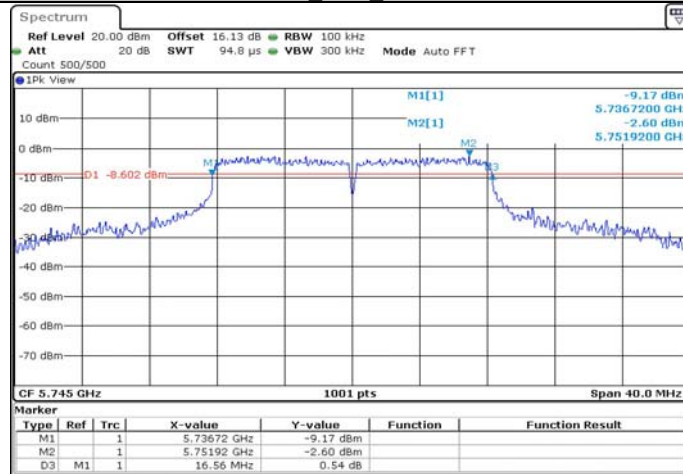


**Appendix A3: Min emission bandwidth
Test Result**

TestMode	Antenna	Channel	6db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	16.560	0.5	PASS
		5785	16.560	0.5	PASS
		5825	16.560	0.5	PASS
11N20SISO	Ant1	5745	17.760	0.5	PASS
		5785	17.800	0.5	PASS
		5825	17.800	0.5	PASS
11N40SISO	Ant1	5755	36.560	0.5	PASS
		5795	36.560	0.5	PASS
11AC20SISO	Ant1	5745	17.720	0.5	PASS
		5785	17.800	0.5	PASS
		5825	17.720	0.5	PASS
11AC40SISO	Ant1	5755	36.560	0.5	PASS
		5795	36.480	0.5	PASS
11AC80SISO	Ant1	5775	76.640	0.5	PASS

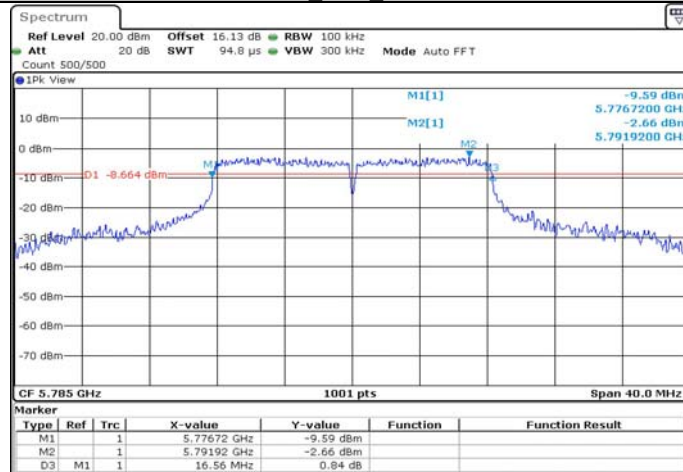
Test Graphs

11A_Ant1_5745



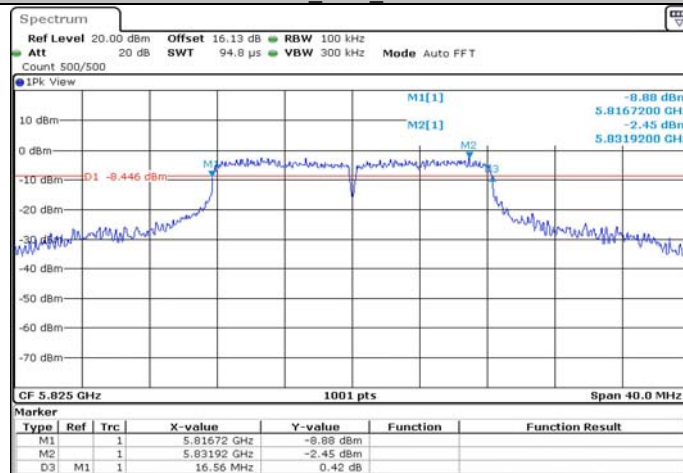
Date: 6, JAN, 2021 15:04:07

11A_Ant1_5785

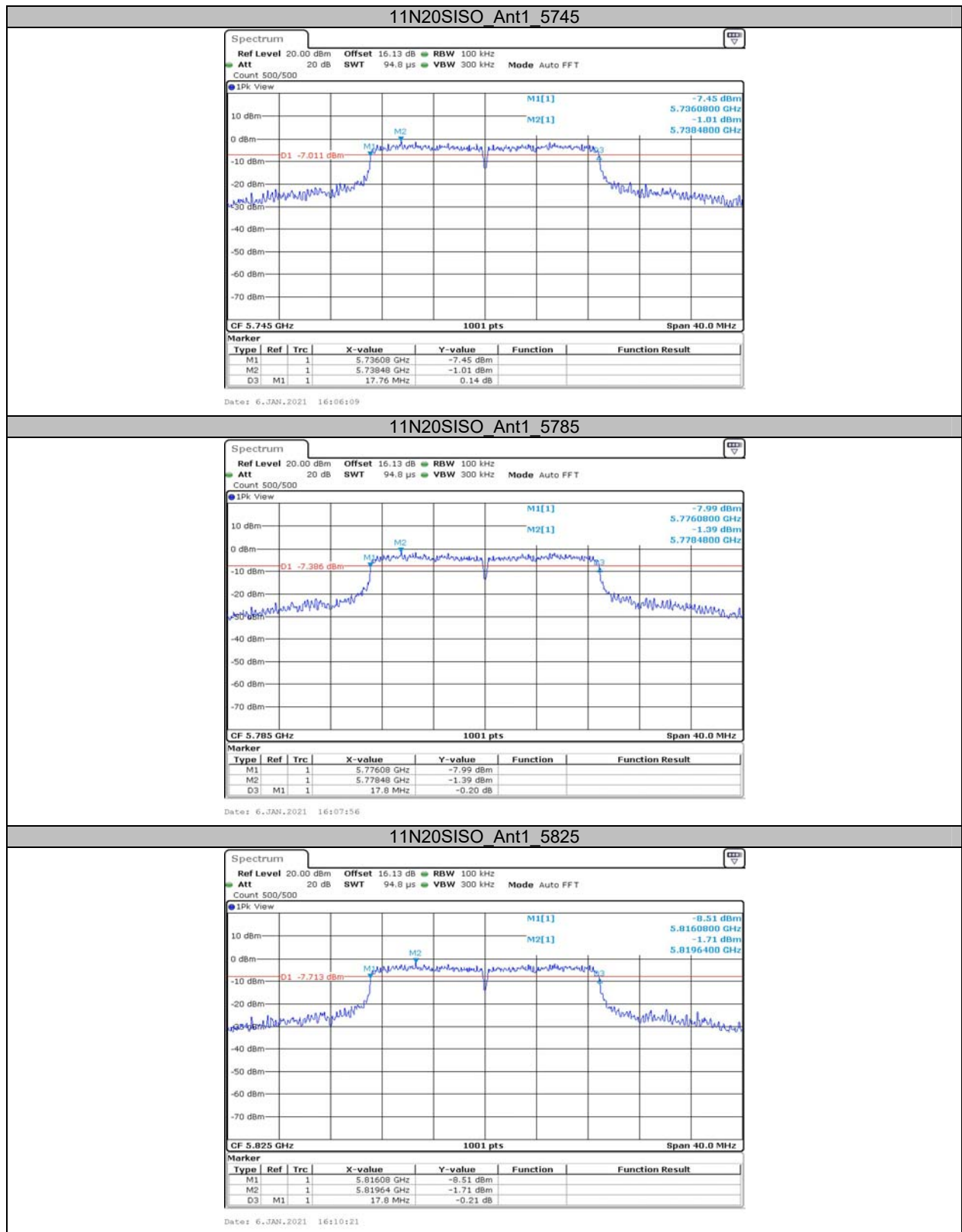


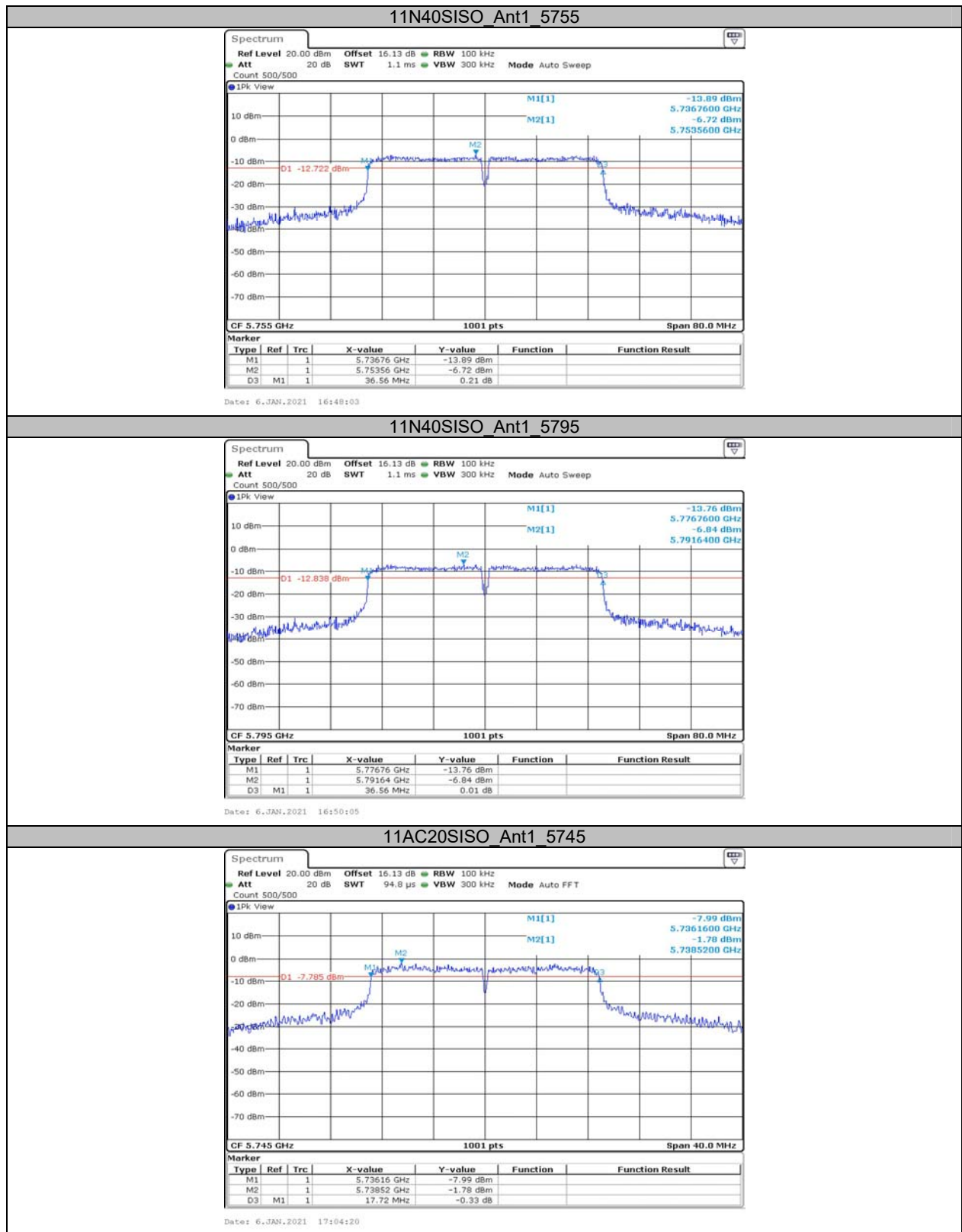
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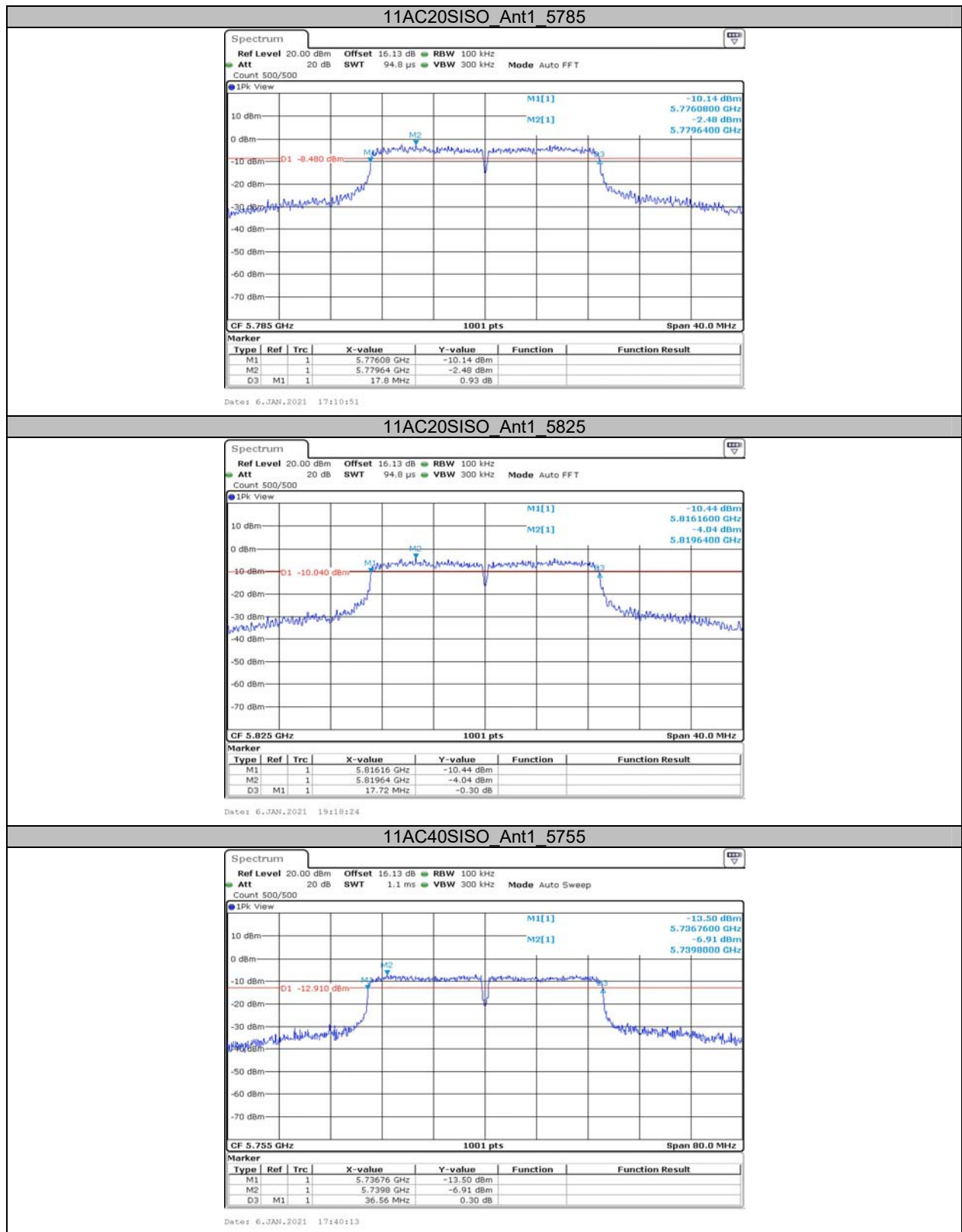
11A_Ant1_5825

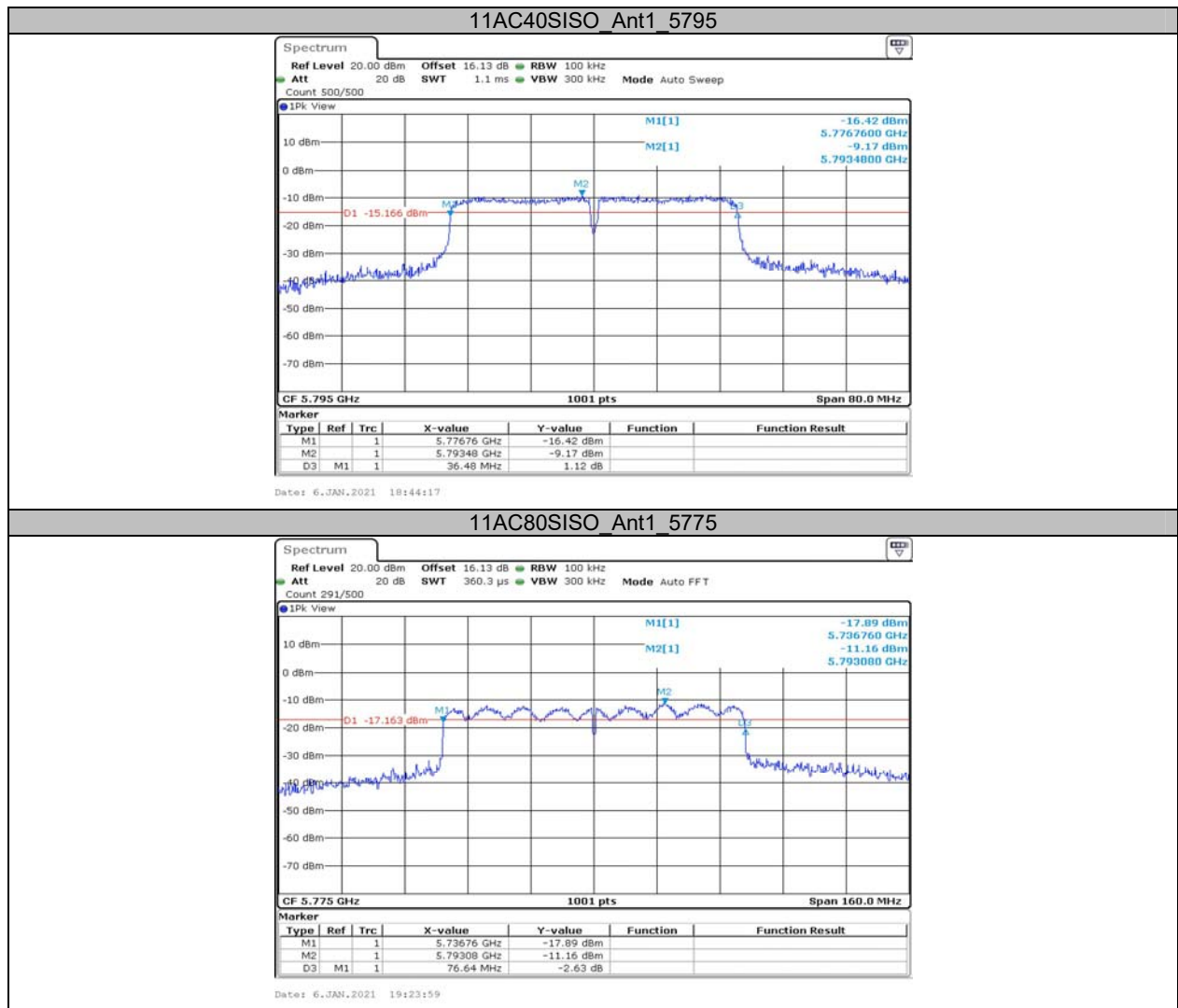


Date: 6, JAN, 2021 15:08:37









Appendix B: Maximum conducted output power Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	9.57	<=23.98	PASS
		5200	10.36	<=23.98	PASS
		5240	11.03	<=23.98	PASS
		5745	12.08	<=30	PASS
		5785	11.99	<=30	PASS
		5825	11.58	<=30	PASS
11N20SISO	Ant1	5180	9.13	<=23.98	PASS
		5200	9.81	<=23.98	PASS
		5240	10.95	<=23.98	PASS
		5745	12.52	<=30	PASS
		5785	12.34	<=30	PASS
		5825	11.93	<=30	PASS
11N40SISO	Ant1	5190	6.92	<=23.98	PASS
		5230	8.32	<=23.98	PASS
		5755	10.22	<=30	PASS
		5795	10.17	<=30	PASS
11AC20SISO	Ant1	5180	6.28	<=23.98	PASS
		5200	9.53	<=23.98	PASS
		5240	10.75	<=23.98	PASS
		5745	11.73	<=30	PASS
		5785	11.74	<=30	PASS
		5825	9.31	<=30	PASS
11AC40SISO	Ant1	5190	6.42	<=23.98	PASS
		5230	7.97	<=23.98	PASS
		5755	10.05	<=30	PASS
		5795	7.81	<=30	PASS
11AC80SISO	Ant1	5210	4.94	<=23.98	PASS
		5775	5.41	<=30	PASS

Appendix C: Maximum power spectral density Test Result

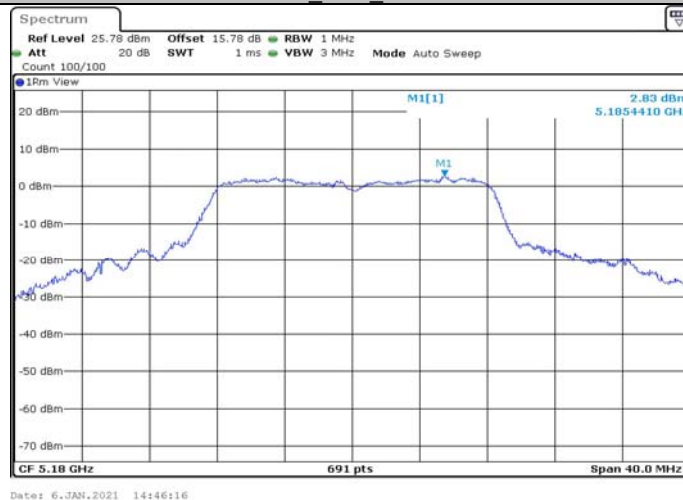
TestMode	Antenna	Channel	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5180	2.83	<=11	PASS
		5200	3.23	<=11	PASS
		5240	4.23	<=11	PASS
		5745	3.91	<=30	PASS
		5785	3.57	<=30	PASS
		5825	3.62	<=30	PASS
11N20SISO	Ant1	5180	2.2	<=11	PASS
		5200	2.52	<=11	PASS
		5240	3.98	<=11	PASS
		5745	4.54	<=30	PASS
		5785	4.48	<=30	PASS
		5825	4.04	<=30	PASS
11N40SISO	Ant1	5190	-3.16	<=11	PASS
		5230	-1.25	<=11	PASS
		5755	-1.25	<=30	PASS
		5795	-1.36	<=30	PASS
11AC20SISO	Ant1	5180	0.47	<=11	PASS
		5200	2.17	<=11	PASS
		5240	3.83	<=11	PASS
		5745	3.85	<=30	PASS
		5785	3.76	<=30	PASS
		5825	-0.14	<=30	PASS
11AC40SISO	Ant1	5190	-3.51	<=11	PASS
		5230	-1.5	<=11	PASS
		5755	-1.43	<=30	PASS
		5795	-3.34	<=30	PASS
11AC80SISO	Ant1	5210	-5.75	<=11	PASS
		5775	-4.21	<=30	PASS

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

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

Test Graphs

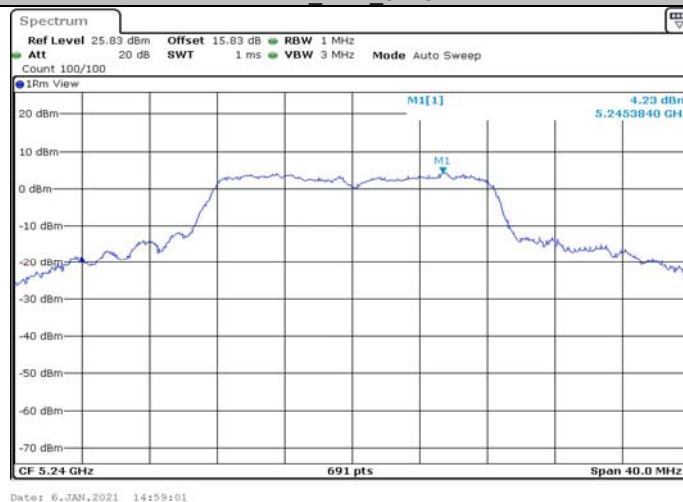
11A_Ant1_5180

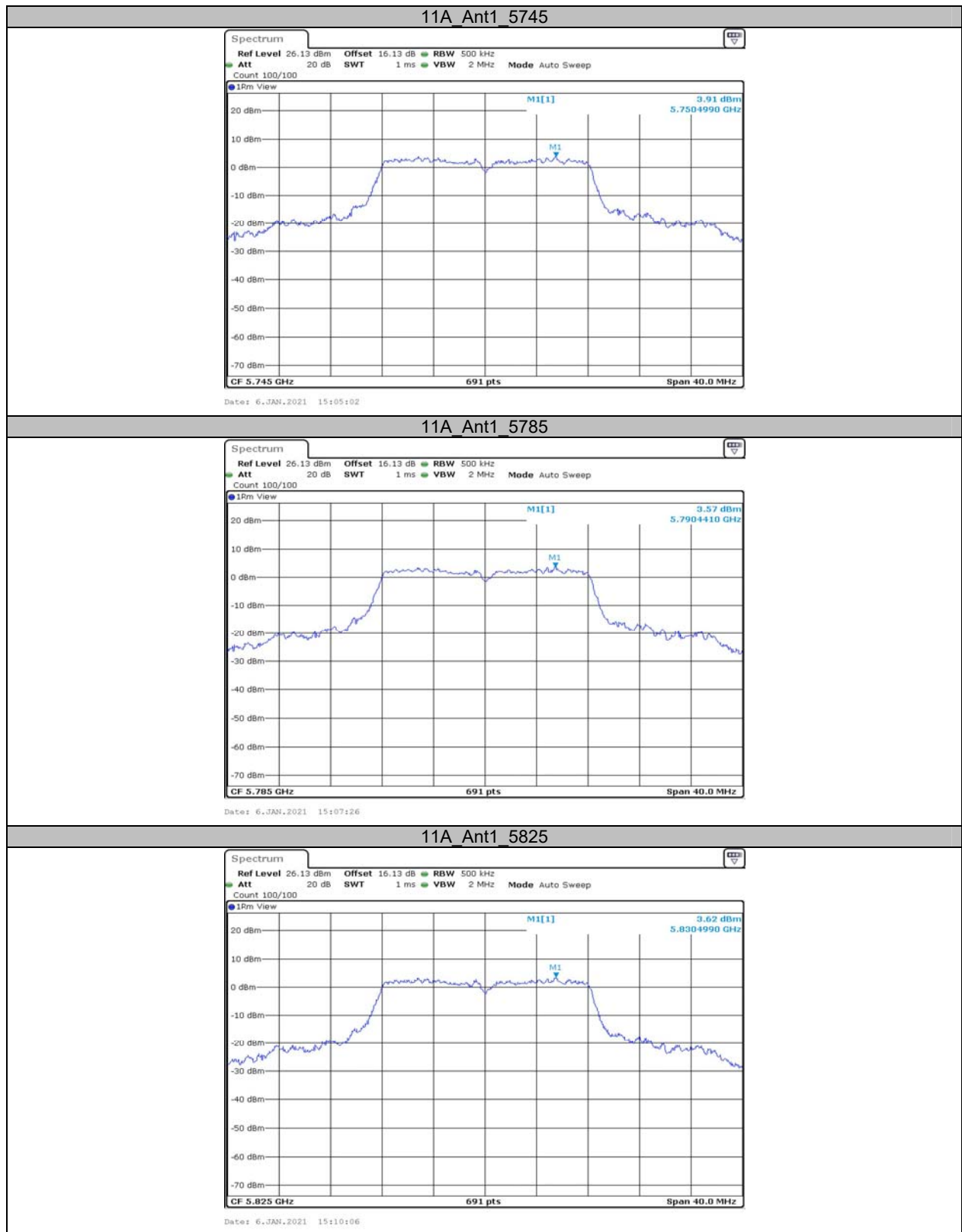


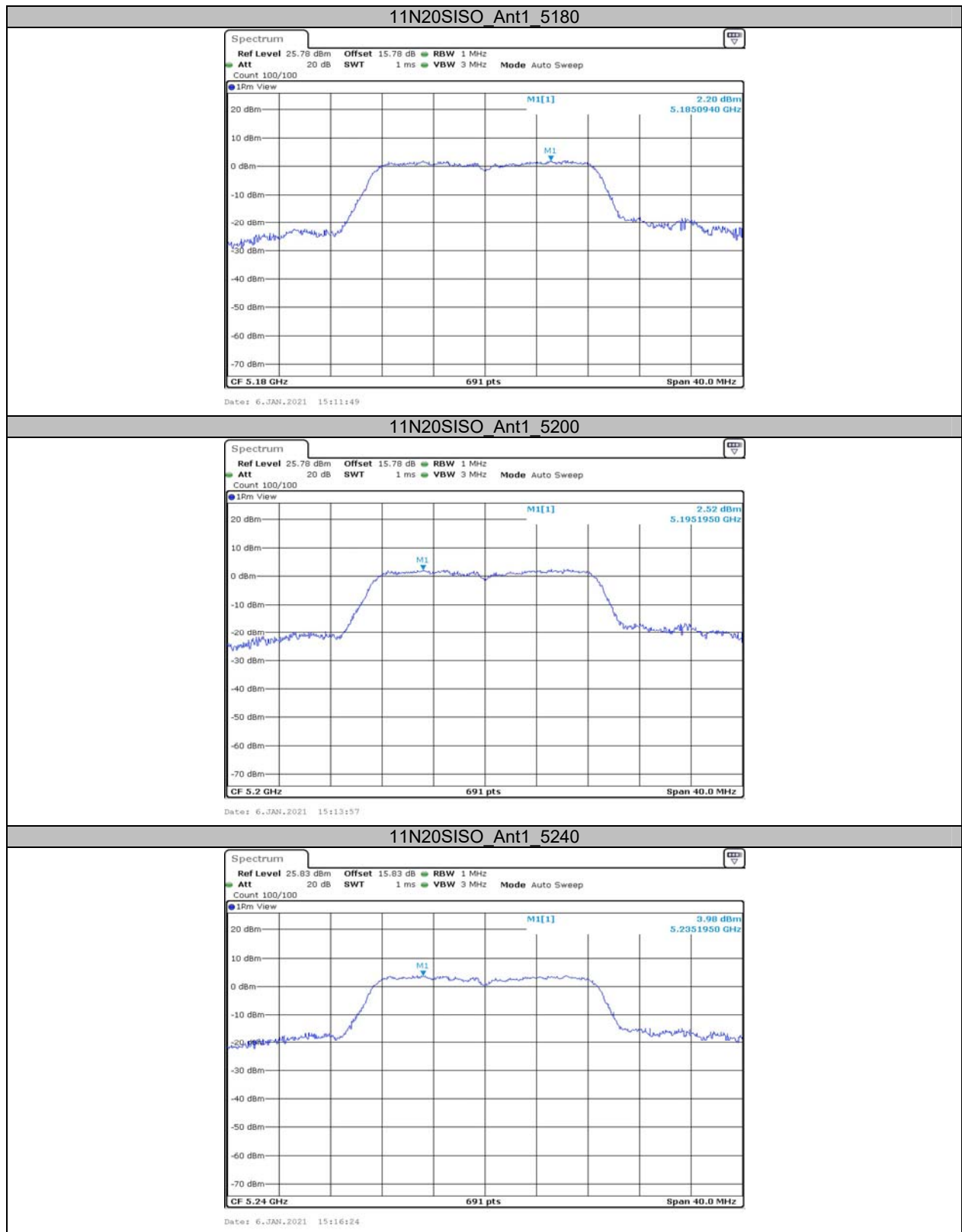
11A_Ant1_5200

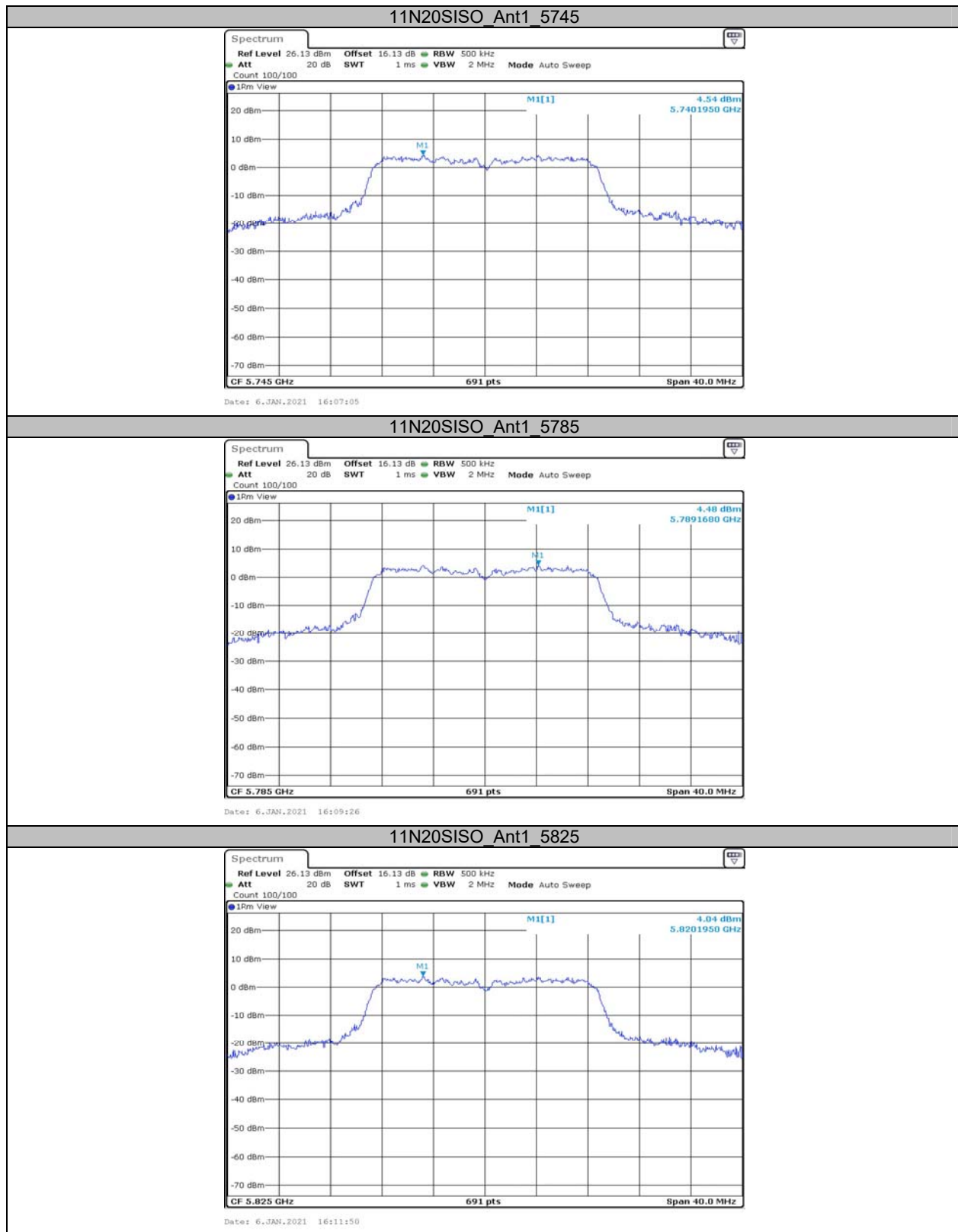


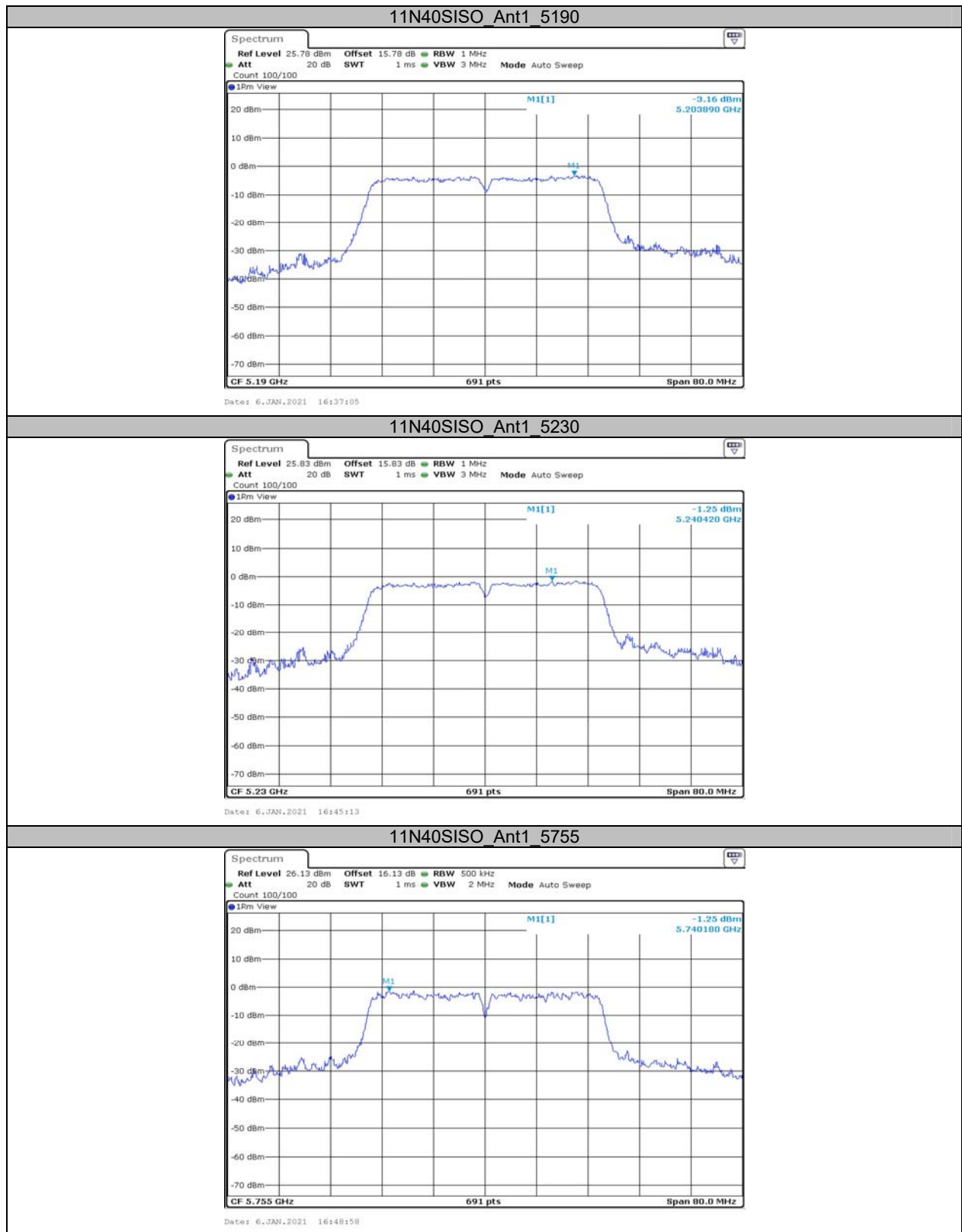
11A_Ant1_5240

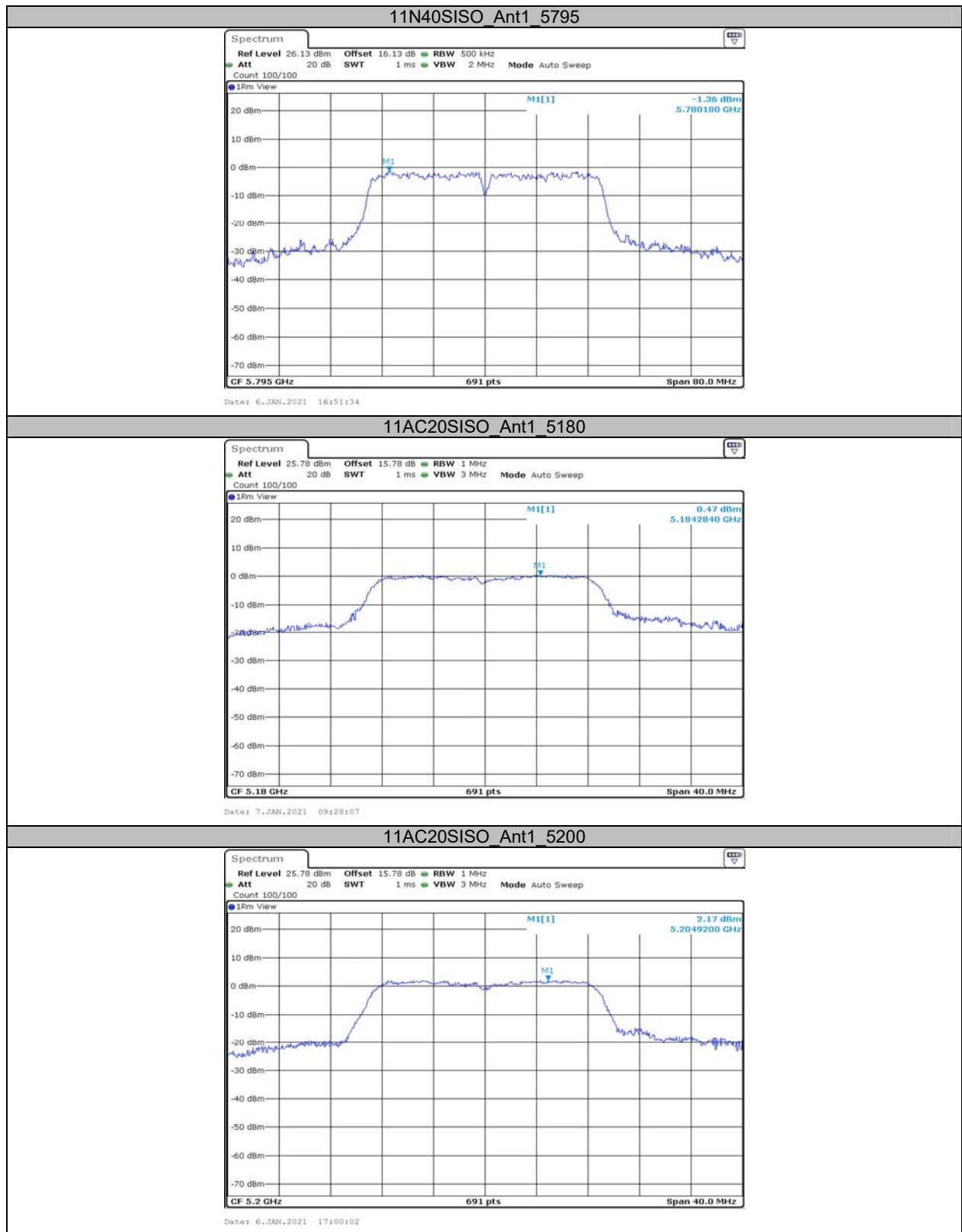




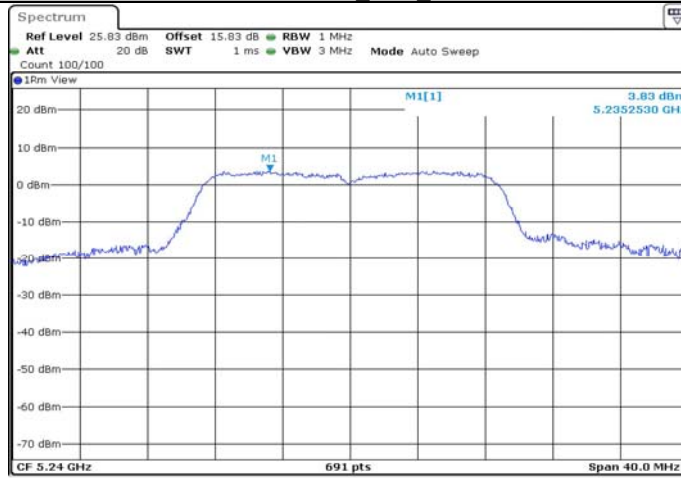






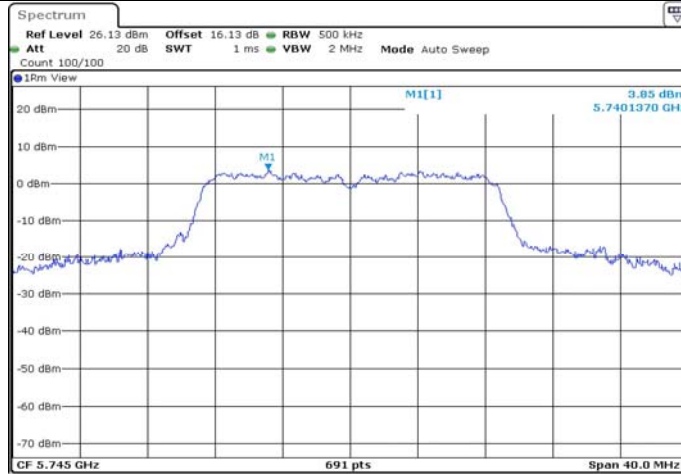


11AC20SISO_Ant1_5240



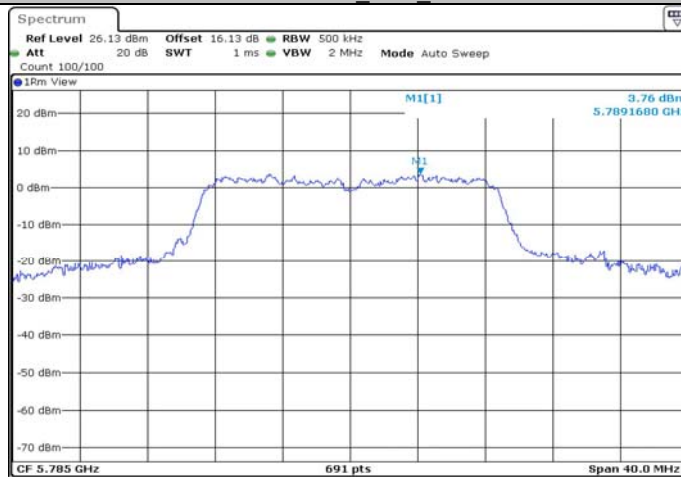
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11AC20SISO_Ant1_5745



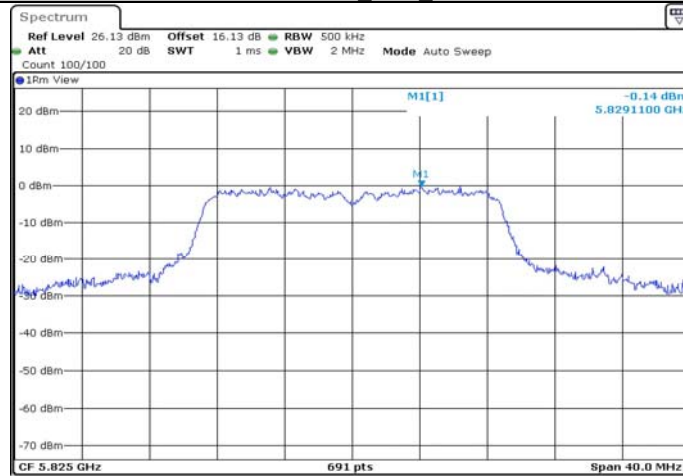
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11AC20SISO_Ant1_5785

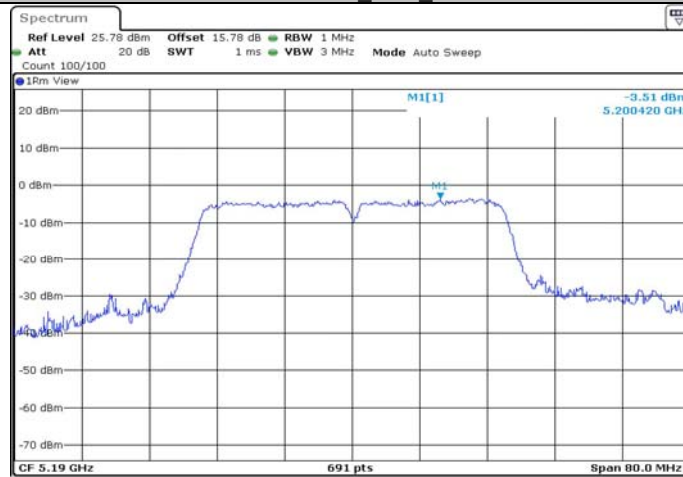


Date: 6.JAN.2021 17:12:21

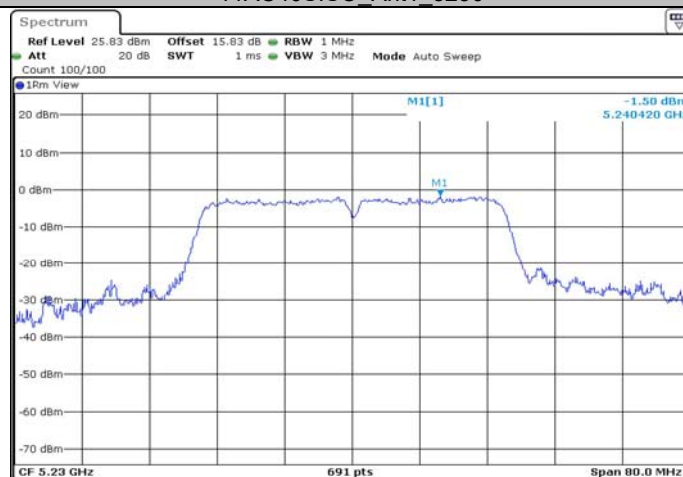
11AC20SISO_Ant1_5825



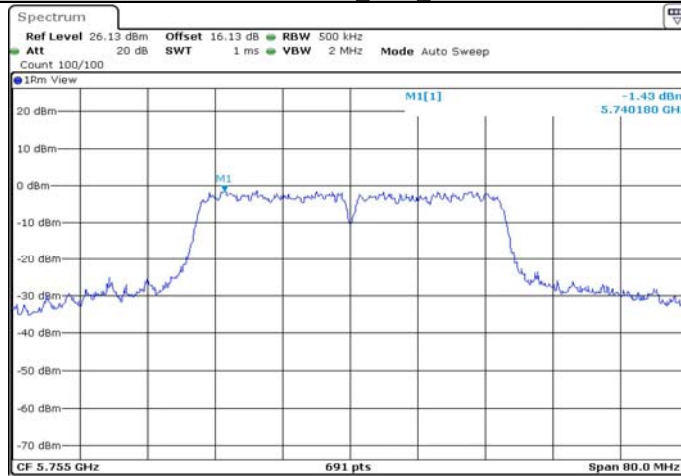
11AC40SISO_Ant1_5190



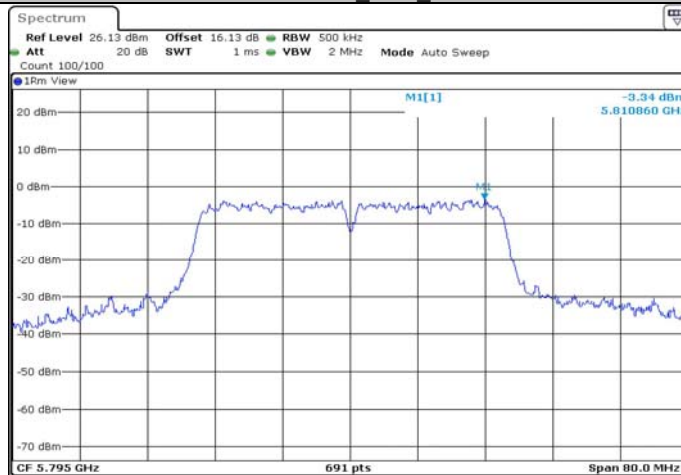
11AC40SISO_Ant1_5230



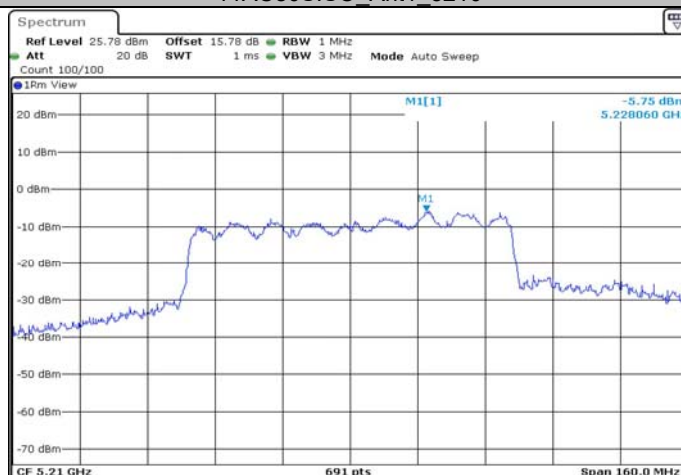
11AC40SISO_Ant1_5755

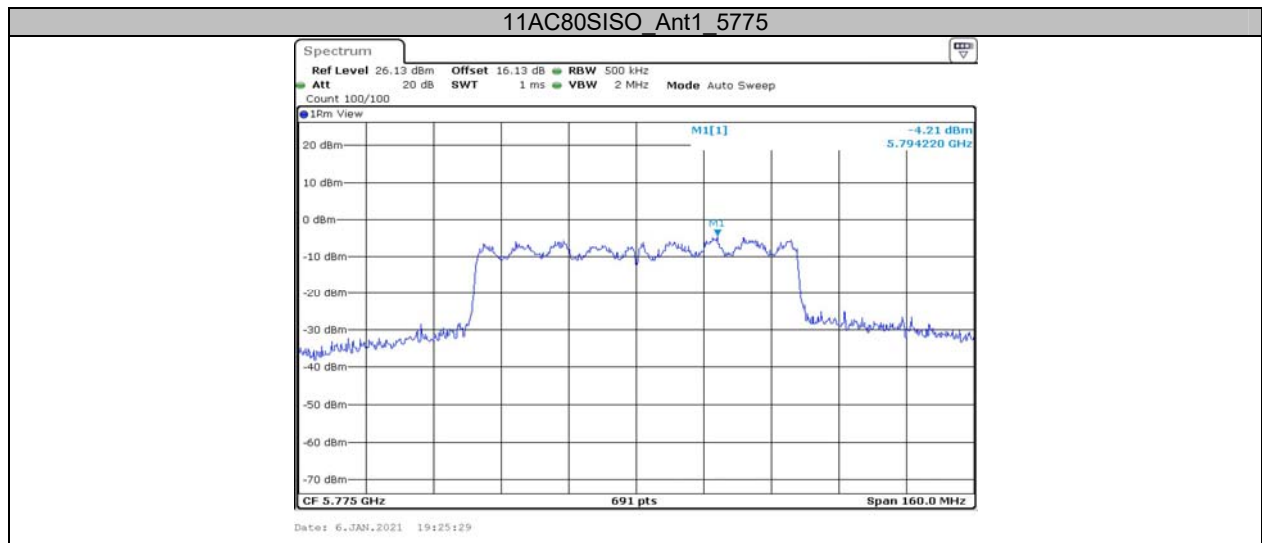


11AC40SISO_Ant1_5795



11AC80SISO_Ant1_5210





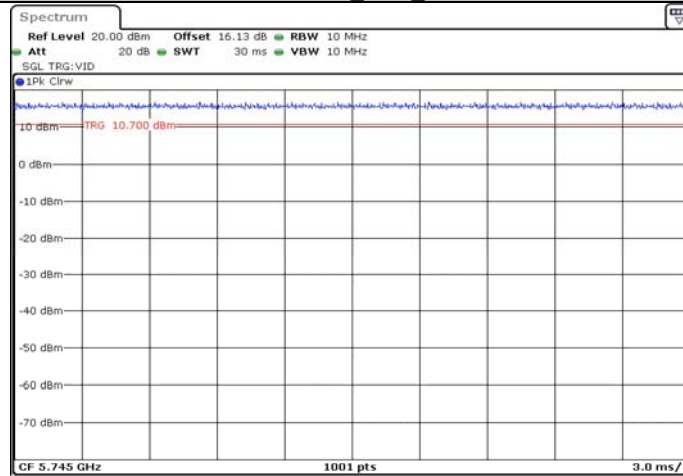
**Appendix D: Duty Cycle
Test Result**

TestMode	Antenna	Channel	TransmissionDuration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5180	30.00	30.00	100.00
		5745	30.00	30.00	100.00
11N20SISO	Ant1	5180	30.00	30.00	100.00
		5745	30.00	30.00	100.00
11N40SISO	Ant1	5190	30.00	30.00	100.00
		5755	30.00	30.00	100.00
11AC20SISO	Ant1	5180	30.00	30.00	100.00
		5745	30.00	30.00	100.00
11AC40SISO	Ant1	5190	30.00	30.00	100.00
		5755	30.00	30.00	100.00
11AC80SISO	Ant1	5210	30.00	30.00	100.00
		5775	30.00	30.00	100.00

Test Graphs

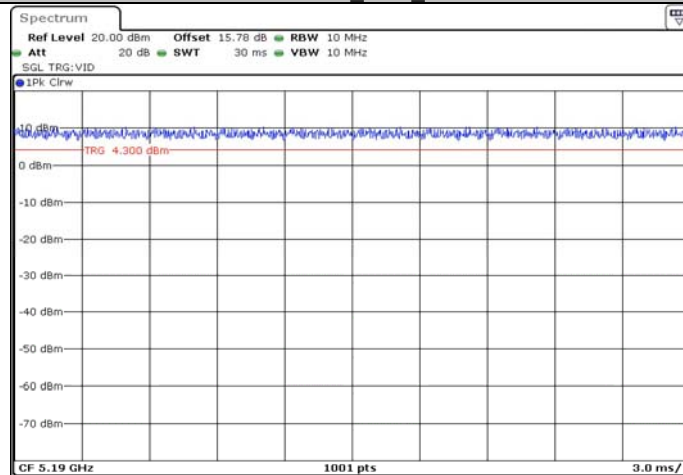


11N20SISO_Ant1_5745



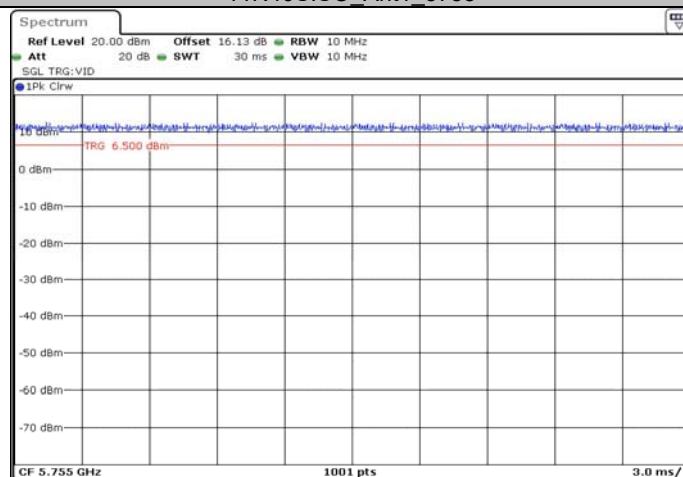
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11N40SISO_Ant1_5190



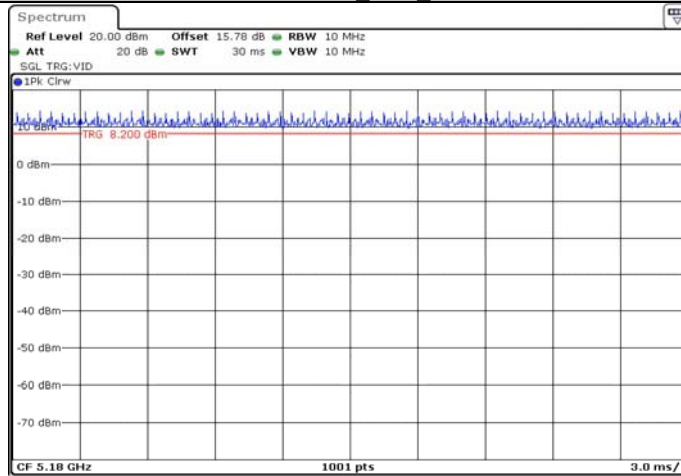
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11N40SISO_Ant1_5755



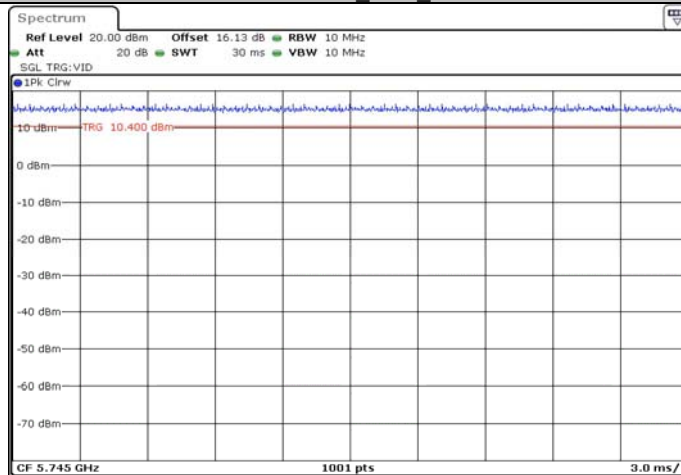
Date: 6.JAN.2021 16:48:40

11AC20SISO_Ant1_5180



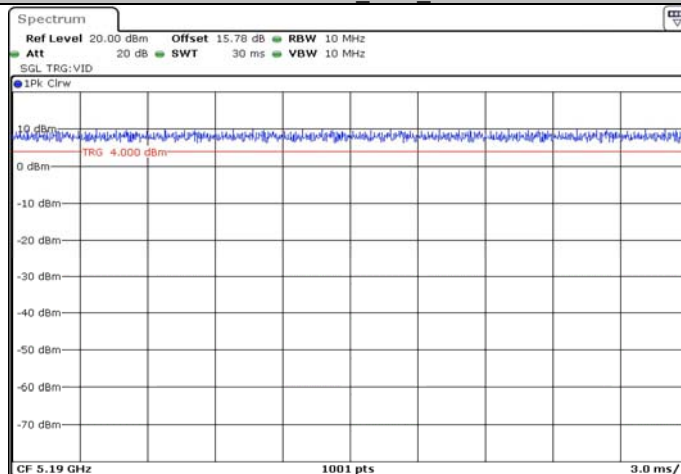
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11AC20SISO_Ant1_5745



Date: 6.JAN.2021 17:04:57

11AC40SISO_Ant1_5190



Date: 6.JAN.2021 17:34:38



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