



FCC PART 15.407

TEST REPORT

For

ShenZhen Foscam Intelligent Technology Co., Ltd.

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Nanshan Dist., Shenzhen China

FCC ID: ZDEV D1

Report Type: Original Report	Product Type: 4.0MP Video Doorbell (Wired)
Report Number: RSZ201104012-00B	
Report Date: 2021-02-07	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	4.0MP Video Doorbell (Wired)
Tested Model	VD1
Multiple Model	DBW5, DBW6, DBW7, DBW8, VD2, VD3, VD4, VD5, MBS4010, MBS4011, MBS4012, MBS4013
Model Differences	Refer to the DoS letter
Frequency Range	5G Wi-Fi: 5725-5850 MHz
Transmit Power	5725-5850 MHz 16.84dBm (802.11a), 15.10dBm(802.11n20), 13.90dBm(802.11n40), 16.70dBm(802.11ac20), 14.30dBm (802.11ac 40),13.00dBm(802.11 ac80)
Modulation Technique	Wi-Fi: OFDM
Antenna Specification	2*2MIMO, 2.0dBi
Voltage Range	DC 3.7V battery or DC 8~24V or DC 5.0V from Type-C port
Date of Test	2020-11-25 to 2021-02-06
Sample number	RSZ201104012-RF-S1(Assigned by BACL, Shenzhen)
Received date	2020-11-04
Sample/EUT Status	Good condition

Objective

This type approval 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

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 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, 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.: 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 system was configured for testing in an engineering mode, which was provided by manufacturer.

The device support 802.11a/n20/n40/ac20/ac40/ac80 modes

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

EUT Exercise Software

“SureCRT” software was use to the EUT tested and the power lever is 40.* The software and power level was provided by the applicant.

Duty cycle:

Please refer to the Appendix.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

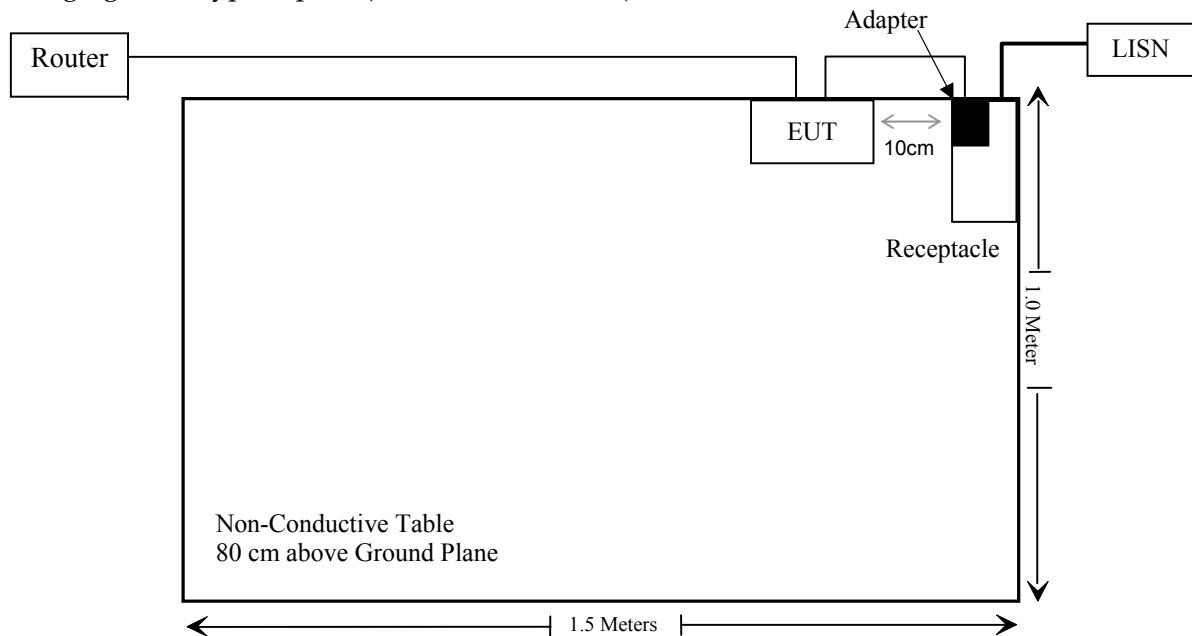
Manufacturer	Description	Model	Serial Number
HIKVISION	ROUTER	DS-3WR03-E	10021642429
YEZZ	Adapter	YW1000US	E134646
Zhaoxin	DC Power Supply	RXN-303A	Unknown

External I/O Cable

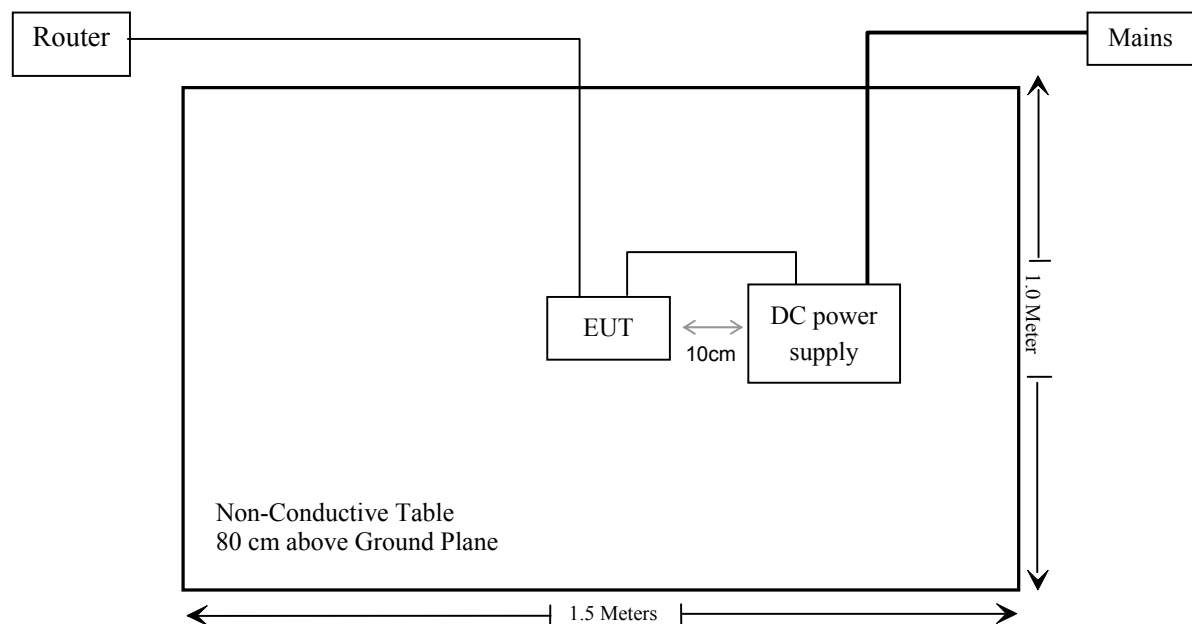
Cable Description	Length (m)	From Port	To
Unshielded detachable USB cable	0.5	Adapter	EUT
Unshielded detachable RJ45 cable	2.0	Router	EUT
Unshielded detachable DC cable	1.0	DC Power Supply	EUT
Unshielded detachable AC cable	1.5	DC Power Supply	Mains

Block Diagram of Test Setup

Charging from Type-C port: (conducted emission)



Charging from DC input port: (radiated emission (below 1GHz))



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1310&§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),(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
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
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					
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	A040904-1	2017/12/22	2020/12/21
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2020/12/22	2021/12/21
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
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2020/08/04	2021/08/03
COM-POWER	Pre-amplifier	PA-122	181919	2019/11/29	2020/11/28
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2019/11/29	2020/11/28
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2019/11/29	2020/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2019/11/29	2020/11/28
SNSD	Band Reject filter	BSF2402-2480MN-0898-001	2.4G filter	2020/04/20	2021/04/20
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-021304	2019/12/06	2022/12/05
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-03	2019/12/06	2022/12/05

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 §1.1310& §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1310 and subpart 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	5725-5850	2.0	1.58	17.0	50.12	20	0.016	1

Note: 1. the tune up conducted power was declared by the applicant
2. the 2.4G Wi-Fi can not 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 two internal antenna arrangement for Wi-Fi, which were permanently attached and the antenna gain is 2.0 dBi for both Antennas, fulfill the requirement of this section. Please refer to the EUT photos.

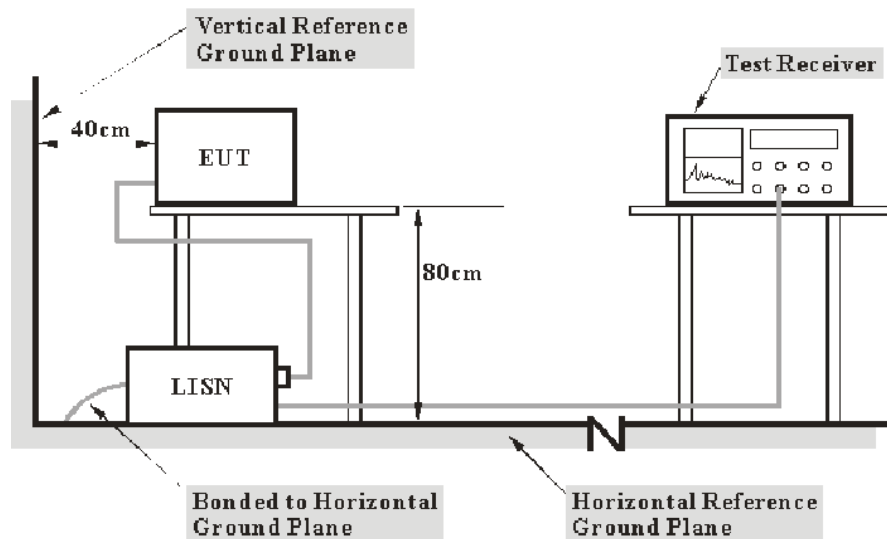
Result: Pass.

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.

The adapter was connected to a 120 VAC/60 Hz power source.

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 Results Summary

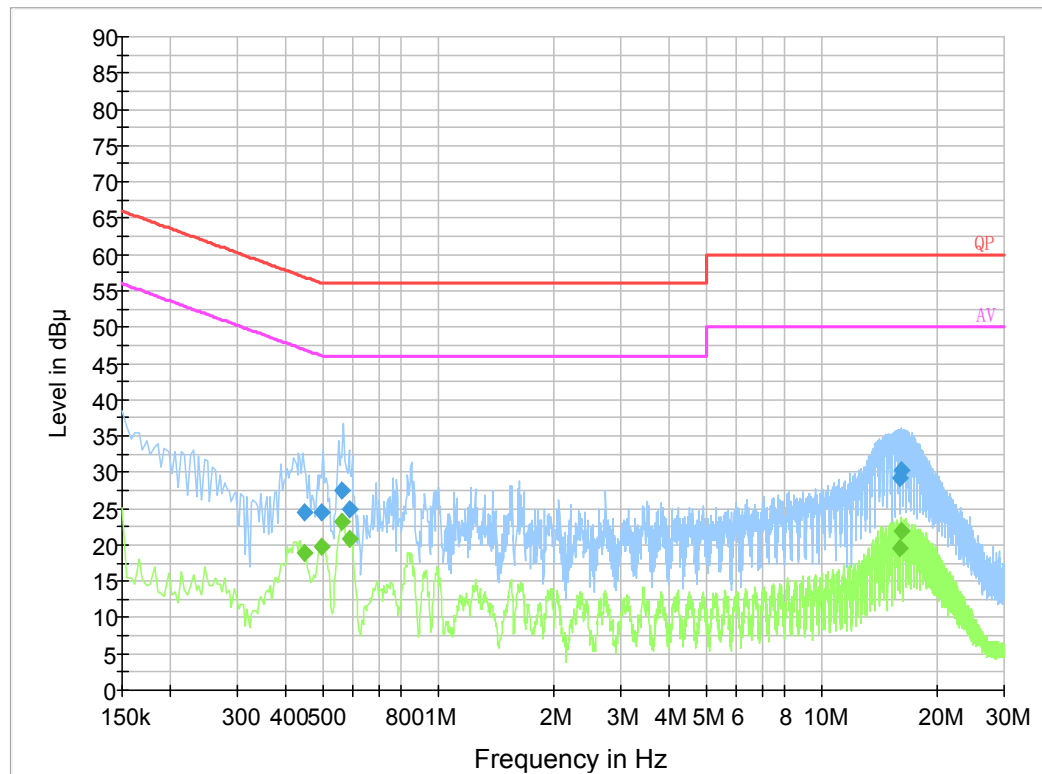
According to the EUT complied with the FCC Part 15.207.

Test Data**Environmental Conditions**

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

The testing was performed by Haiguo Li on 2021-02-06.

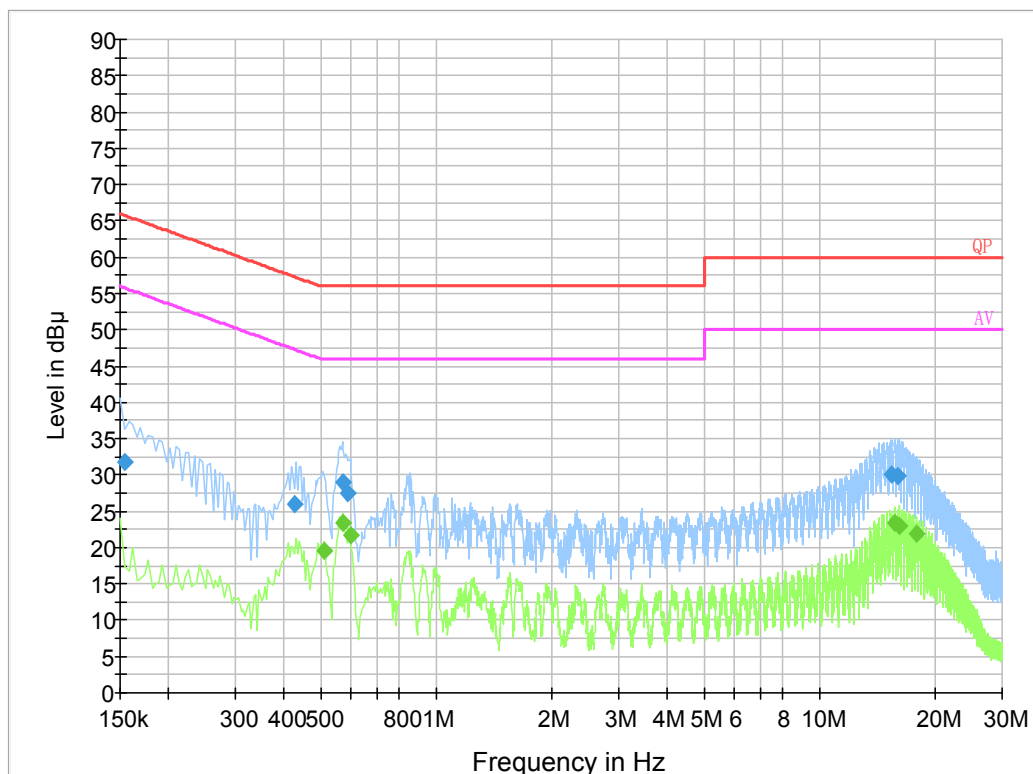
EUT operation mode: Transmitting (worst case is MIMO mode)

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)
0.447310	24.6	9.000	L1	19.8	32.3	56.9
0.498470	24.5	9.000	L1	19.8	31.5	56.0
0.561510	27.6	9.000	L1	19.8	28.4	56.0
0.589030	25.0	9.000	L1	19.8	31.0	56.0
16.031830	29.1	9.000	L1	20.1	30.9	60.0
16.131570	30.2	9.000	L1	20.1	29.8	60.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.447310	18.9	9.000	L1	19.8	28.0	46.9
0.498470	19.7	9.000	L1	19.8	26.3	46.0
0.561510	23.1	9.000	L1	19.8	22.9	46.0
0.589030	20.9	9.000	L1	19.8	25.1	46.0
16.031830	19.6	9.000	L1	20.1	30.4	50.0
16.131570	21.9	9.000	L1	20.1	28.1	50.0

AC120V, 60 Hz, Neutral:**Final Result 1**

Frequency (MHz)	QuasiPeak (dB μV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.154500	31.9	9.000	N	19.8	33.9	65.8
0.427550	26.0	9.000	N	19.8	31.3	57.3
0.569450	29.0	9.000	N	19.8	27.0	56.0
0.589030	27.4	9.000	N	19.8	28.6	56.0
15.383270	30.1	9.000	N	20.0	29.9	60.0
16.076710	29.9	9.000	N	20.0	30.1	60.0

Final Result 2

Frequency (MHz)	Average (dB μV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.510000	19.6	9.000	N	19.8	26.4	46.0
0.574000	23.3	9.000	N	19.8	22.7	46.0
0.598000	21.6	9.000	N	19.8	24.4	46.0
15.758000	23.3	9.000	N	20.0	26.7	50.0
16.102000	23.0	9.000	N	20.1	27.0	50.0
17.902000	21.9	9.000	N	20.2	28.1	50.0

Note:

- 1) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

§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.

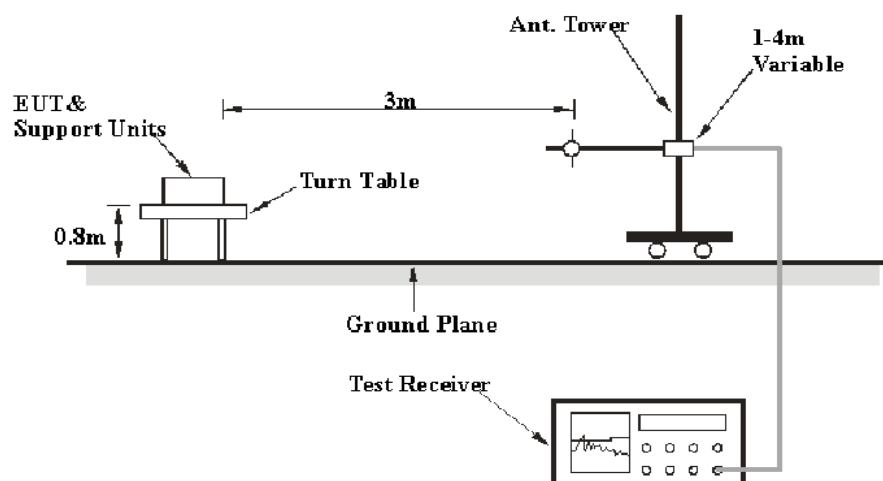
KDB 789033 D02 General UNII Test Procedures New Rules v02r01, clause G),

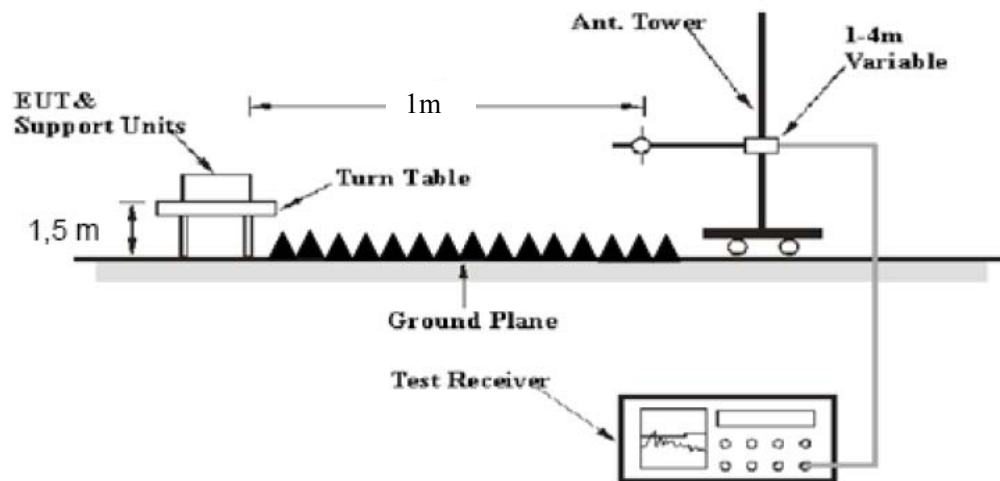
$E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] - 20 \log(d[\text{m}]) + 104.77$, where E = field strength and d = distance at which field strength limit is specified.

For FCC §15.407 (b) (1), (2), (3), (4), $d=1\text{m}$, non-Restricted bands limit $= -27 - 20 \log(1) + 104.77 = 77.7 \text{ dB}\mu\text{V/m}$

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: 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 dBμV/m
E_{Meas}	is the field strength of the emission at the measurement distance, in dBμV/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

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 Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart E, section 15.205, 15.209 and 15.407 rules.

Test Data

Environmental Conditions

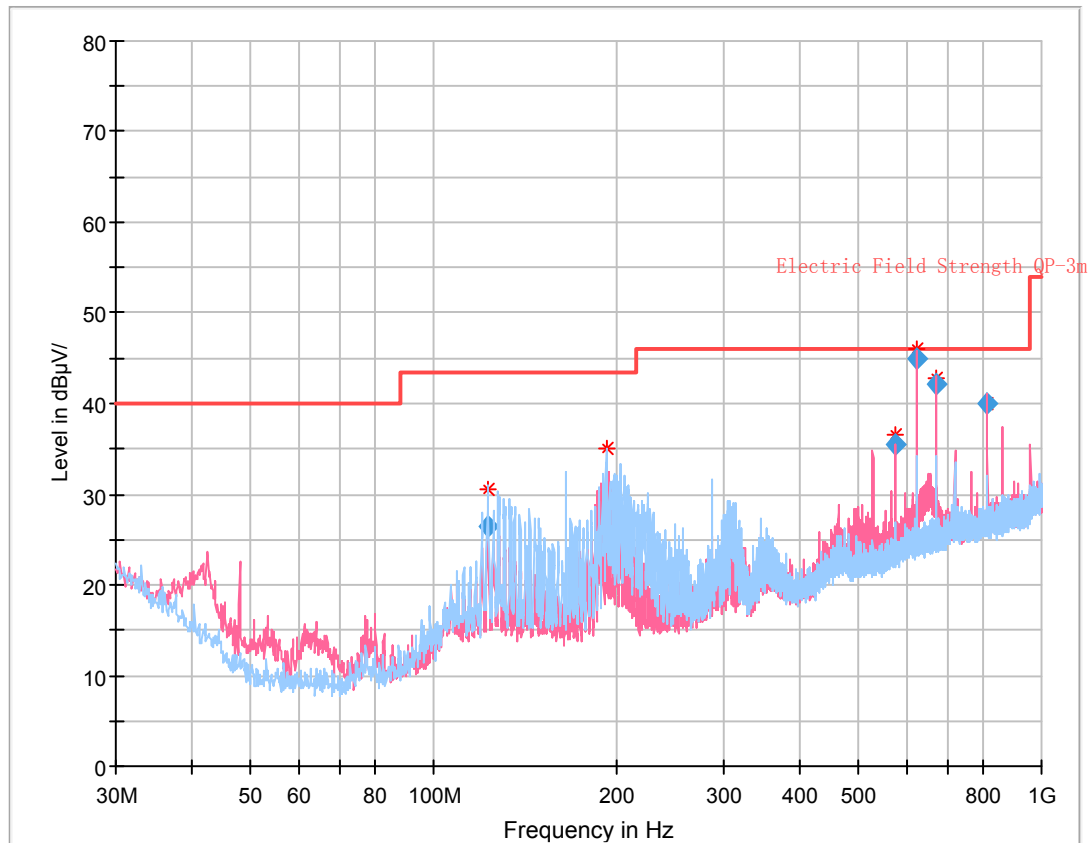
Temperature:	27~27.1 °C
Relative Humidity:	42~51 %
ATM Pressure:	101.0 kPa

The testing was performed by Holland Yang on 2020-12-08 and 2021-01-22 for below 1GHz and Leven Gan on 2020-11-25 for above 1GHz.

EUT operation mode: Transmitting (worst case is MIMO mode)

30 MHz – 1 GHz: (worst case is 802.11a mode 5745 MHz)

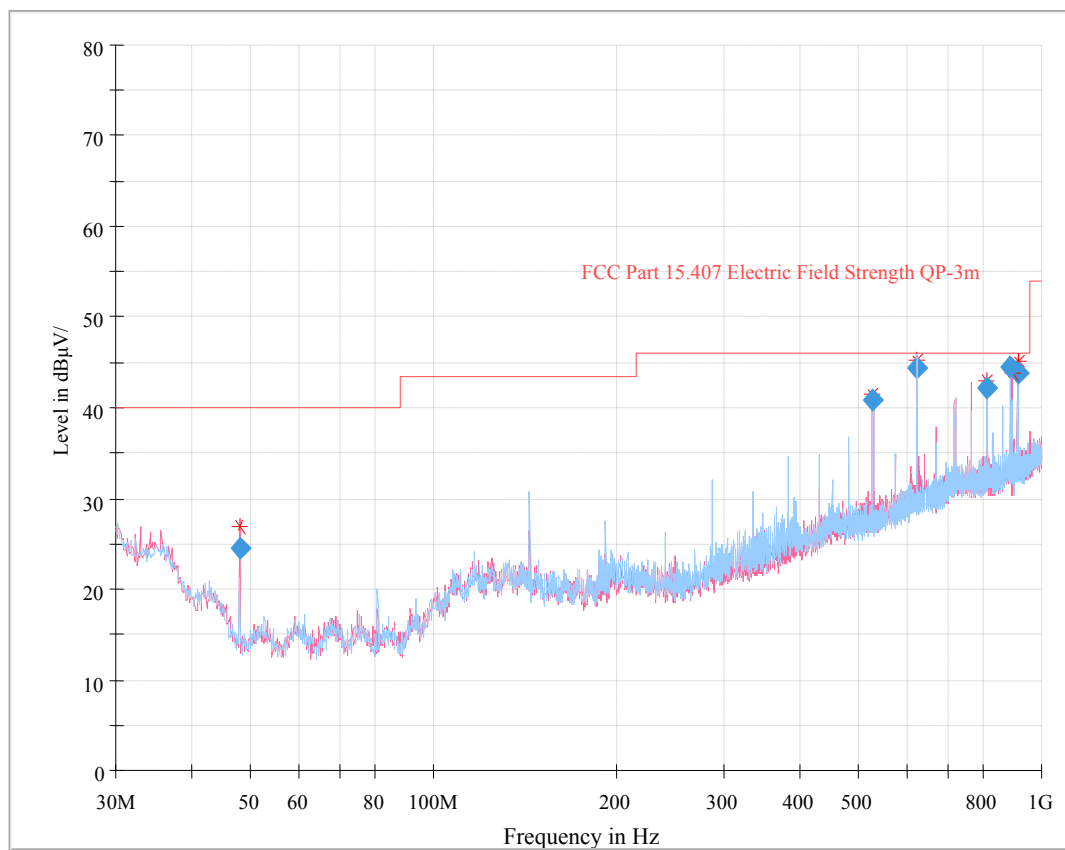
Charging from Type-C port:



Final Result

Frequency (MHz)	QuasiPeak (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
122.632375	26.53	43.50	16.97	154.0	H	108.0	-11.4
192.464125	27.92	43.50	15.58	119.0	H	104.0	-11.7
576.013125	35.54	46.00	10.46	102.0	V	243.0	-3.1
624.029750	45.00	46.00	1.00	110.0	V	108.0	-2.1
672.016500	42.06	46.00	3.94	109.0	V	67.0	-1.7
816.035625	40.10	46.00	5.90	130.0	V	128.0	0.0

Charging from DC input port:



Final Result

Frequency (MHz)	QuasiPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
47.955314	19.66	40.00	20.34	157.0	V	8.0	-5.4
527.847532	41.08	46.00	4.92	145.0	H	157.0	1.3
623.995625	44.74	46.00	1.26	105.0	V	231.0	3.3
816.112365	42.68	46.00	3.32	174.0	V	126.0	0.2
888.514638	44.88	46.00	1.12	154.0	V	261.0	8.8
913.146847	43.84	46.00	2.16	131.0	H	187.0	7.2

30 MHz ~ 40 GHz:**5725-5850MHz:**

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)			Limit (dBμV/m)	Margin (dB)
802.11A									
5745 MHz									
5637.84	32.17	PK	35	1.8	H	39.46	71.63	77.7	6.07
5675.36	31.91	PK	182	1.5	H	39.49	71.40	96.47	25.07
5717.18	33.50	PK	204	1.3	H	39.49	72.99	119.51	46.52
5723.43	35.47	PK	85	2.2	H	39.49	74.96	128.12	53.16
11490.00	43.25	PK	101	1.3	H	17.47	60.72	83.5	22.78
11490.00	31.45	Ave.	101	1.3	H	17.47	48.92	63.5	14.58
5785 MHz									
11570.00	44.35	PK	228	2.0	H	17.51	61.86	83.5	21.64
11570.00	31.22	Ave.	228	2.0	H	17.51	48.73	63.5	14.77
5825 MHz									
5850.13	35.37	PK	145	2.0	H	39.87	75.24	131.4	56.16
5856.44	32.58	PK	321	1.0	H	39.87	72.45	119.9	47.45
5905.07	34.39	PK	10	2.4	H	39.87	74.26	97.45	23.19
5968.60	33.32	PK	5	1.6	H	39.84	73.16	77.7	4.54
11650.00	44.53	PK	131	1.8	H	16.18	60.71	83.5	22.79
11650.00	31.77	Ave.	131	1.8	H	16.18	47.95	63.5	15.55
802.11N20									
5745 MHz									
5633.71	31.58	PK	7	2.1	H	39.46	71.04	77.7	6.66
5691.43	32.78	PK	308	2.4	H	39.49	72.27	108.36	36.09
5707.48	33.48	PK	275	1.9	H	39.49	72.97	116.79	43.82
5724.85	36.12	PK	106	1.9	H	39.49	75.61	131.36	55.75
11490.00	44.12	PK	156	1.4	H	17.47	61.59	83.5	21.91
11490.00	30.24	Ave.	156	1.4	H	17.47	47.71	63.5	15.79
5785 MHz									
11570.00	44.12	PK	294	1.7	H	17.51	61.63	83.5	21.87
11570.00	30.61	Ave.	294	1.7	H	17.51	48.12	63.5	15.38
5825 MHz									
5851.86	36.38	PK	122	1.6	H	39.87	76.25	127.46	51.21
5868.88	33.96	PK	293	1.6	H	39.87	73.83	116.41	42.58
5879.09	32.82	PK	308	1.7	H	39.87	72.69	111.67	38.98
5933.48	33.97	PK	190	1.2	H	39.97	73.94	77.7	3.76
11650.00	44.31	PK	343	2.0	H	16.18	60.49	83.5	23.01
11650.00	30.58	Ave.	343	2.0	H	16.18	46.76	63.5	16.74

Frequency (MHz)	Receiver		Turntable	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBµV/m)	FCC Part 15.407	
	Reading (dBµV)	PK/QP/Ave.	Degree	Height (m)	Polar (H / V)			Limit (dBµV/m)	Margin (dB)
802.11N40									
5755 MHz									
5613.75	31.78	PK	45	1.4	H	39.46	71.24	77.7	6.46
5654.38	33.64	PK	188	1.1	H	39.49	73.13	80.94	7.81
5711.74	33.33	PK	141	2.4	H	39.49	72.82	117.99	45.17
5723.68	35.79	PK	279	1.5	H	39.49	75.28	128.69	53.41
11510.00	44.36	PK	189	1.3	H	17.47	61.83	83.5	21.67
11510.00	30.45	Ave.	189	1.3	H	17.47	47.92	63.5	15.58
5795 MHz									
5851.37	32.24	PK	236	2.5	H	39.87	72.11	128.58	56.47
5861.41	33.96	PK	28	1.1	H	39.87	73.83	118.51	44.68
5905.14	34.23	PK	146	2.5	H	39.87	74.10	92.4	18.30
5942.76	34.53	PK	169	1.4	H	39.97	74.50	77.7	3.20
11590.00	44.13	PK	23	1.6	H	17.51	61.64	83.5	21.86
11590.00	30.39	Ave.	23	1.6	H	17.51	47.90	63.5	15.60
802.11AC20									
5745 MHz									
5642.71	32.08	PK	83	2.2	H	39.46	71.54	77.7	6.16
5659.52	31.06	PK	222	2.1	H	39.49	70.55	84.74	14.19
5718.74	33.05	PK	18	1.5	H	39.49	72.54	119.95	47.41
5724.12	35.88	PK	201	1.8	H	39.49	75.37	129.69	54.32
11490.00	44.35	PK	137	1.2	H	17.47	61.82	83.5	21.68
11490.00	30.41	Ave.	137	1.2	H	17.47	47.88	63.5	15.62
5785 MHz									
11570.00	44.36	PK	18	1.9	H	17.51	61.87	83.5	21.63
11570.00	30.66	Ave.	18	1.9	H	17.51	48.17	63.5	15.33
5825 MHz									
5854.09	33.92	PK	112	2.1	H	39.87	73.79	122.37	48.58
5868.71	32.88	PK	294	1.5	H	39.87	72.75	116.46	43.71
5920.98	34.70	PK	327	2.0	H	39.97	74.67	80.67	6.00
5957.81	34.28	PK	264	1.4	H	39.84	74.12	77.7	3.58
11650.00	44.78	PK	9	1.9	H	16.18	60.96	83.5	22.54
11650.00	30.68	Ave.	9	1.9	H	16.18	46.86	63.5	16.64

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	FCC Part 15.407	
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)			Limit (dBμV/m)	Margin (dB)
802.11AC40									
5755 MHz									
5629.41	31.96	PK	307	2.3	H	39.46	71.42	77.7	6.28
5661.04	31.06	PK	20	2.0	H	39.49	70.55	85.87	15.32
5703.23	33.42	PK	118	1.7	H	39.49	72.91	115.6	42.69
5723.35	35.68	PK	45	2.3	H	39.49	75.17	127.94	52.77
11510.00	43.98	PK	240	1.5	H	17.47	61.45	83.5	22.05
11510.00	30.47	Ave.	240	1.5	H	17.47	47.94	63.5	15.56
5795 MHz									
5852.64	35.14	PK	19	1.6	H	39.87	75.01	125.68	50.67
5859.09	34.14	PK	46	2.0	H	39.87	74.01	119.15	45.14
5914.98	34.54	PK	114	1.4	H	39.87	74.41	85.11	10.70
5962.75	34.11	PK	188	2.2	H	39.84	73.95	77.7	3.75
11590.00	44.05	PK	4	2.0	H	17.51	61.56	83.5	21.94
11590.00	30.54	Ave.	4	2.0	H	17.51	48.05	63.5	15.45
802.11AC80									
5775 MHz									
5639.85	32.15	PK	298	2.4	H	39.46	71.61	77.7	6.09
5684.19	33.09	PK	68	1.7	H	39.49	72.58	103	30.42
5710.98	32.34	PK	108	2.4	H	39.49	71.83	117.77	45.94
5723.51	35.48	PK	326	1.7	H	39.49	74.97	128.3	53.33
5853.39	34.78	PK	92	2.4	H	39.87	74.65	123.97	49.32
5874.67	33.17	PK	3	1.6	H	39.87	73.04	114.79	41.75
5916.21	33.44	PK	307	1.2	H	39.87	73.31	84.2	10.89
5936.86	34.52	PK	180	2.3	H	39.97	74.49	77.7	3.21
11550.00	43.96	PK	216	1.4	H	17.51	61.47	83.5	22.03
11550.00	30.42	Ave.	216	1.4	H	17.51	47.93	63.5	15.57

Note:

Corrected Amplitude = Corrected Factor + Reading

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

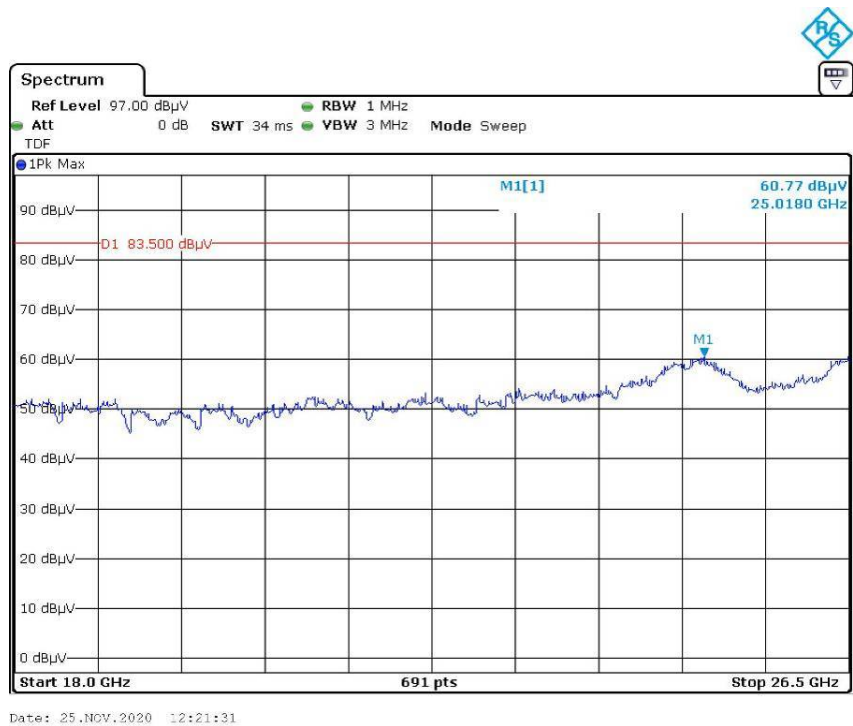
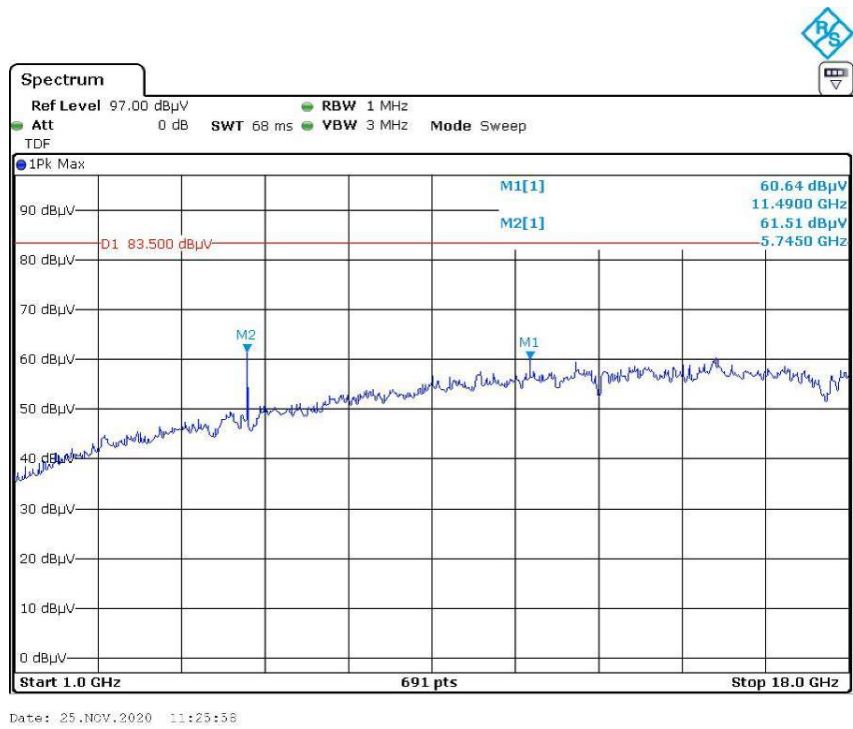
Margin = Limit- Corr. Amplitude

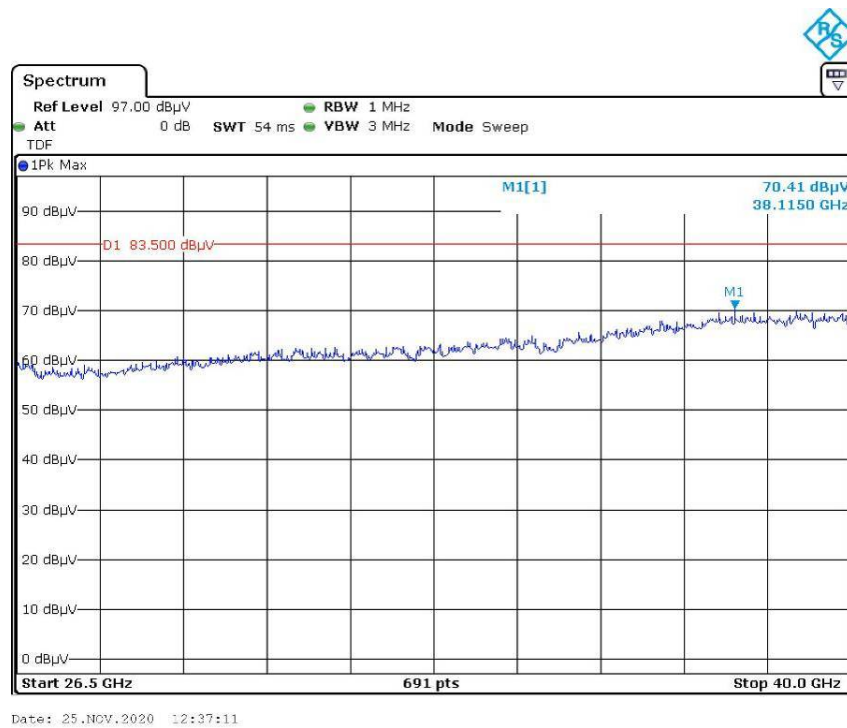
All other spurious emissions are 20 dB below the limit or are on the system noise floor level.

Test at 1m distance for above 1GHz.

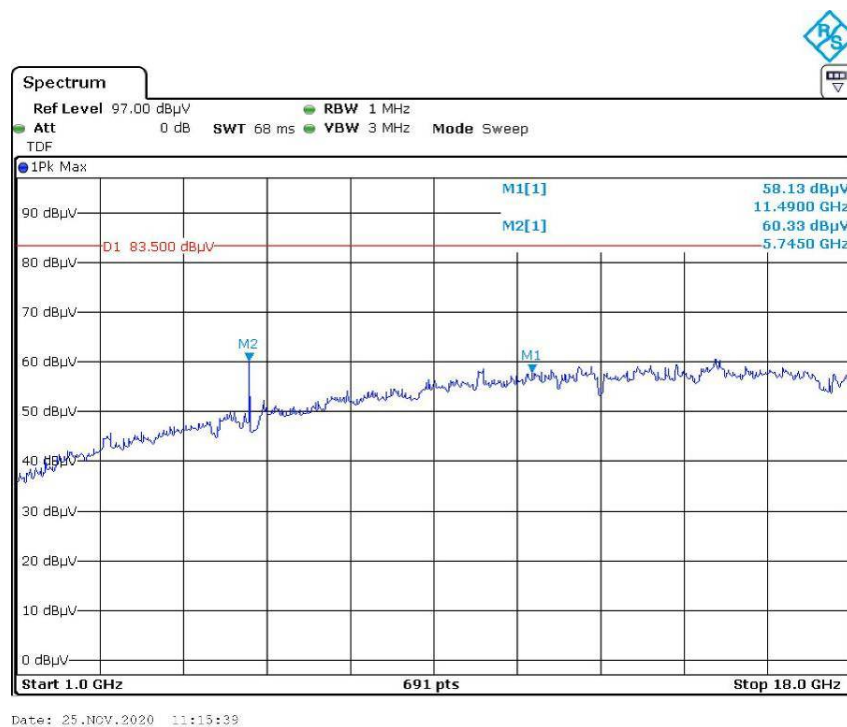
Peak

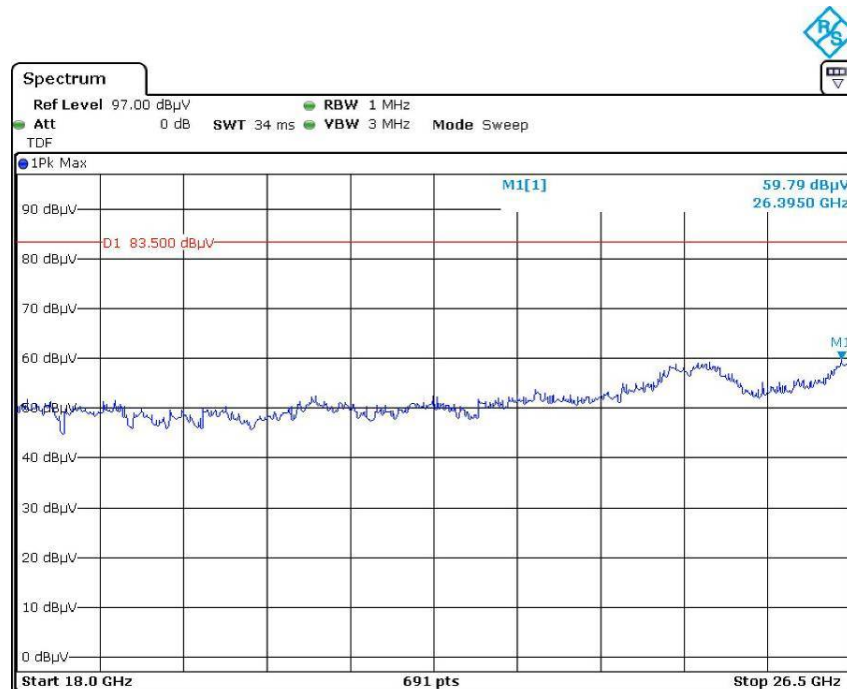
Pre-scan with 802.11a 5745MHz
Horizontal



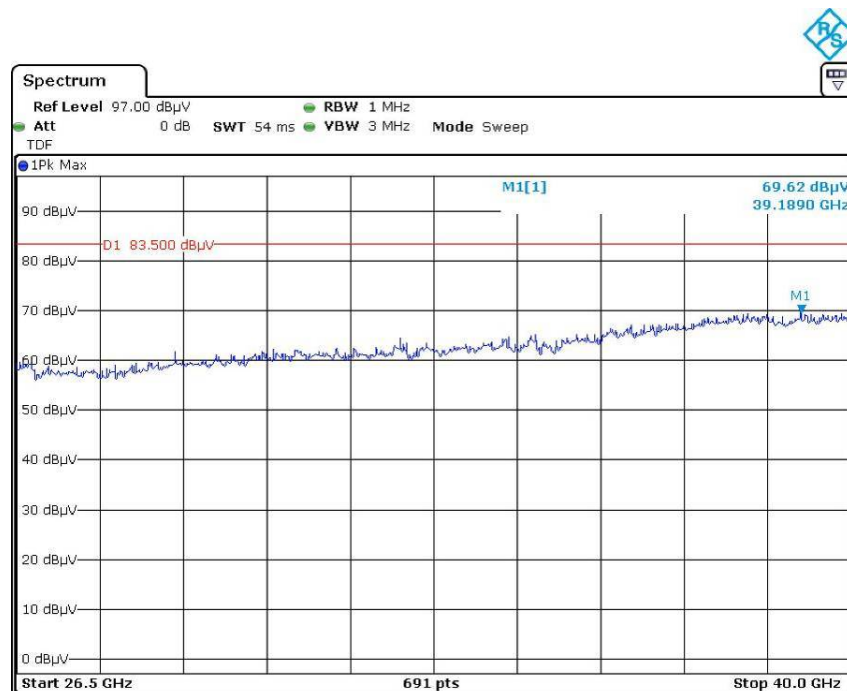


Vertical



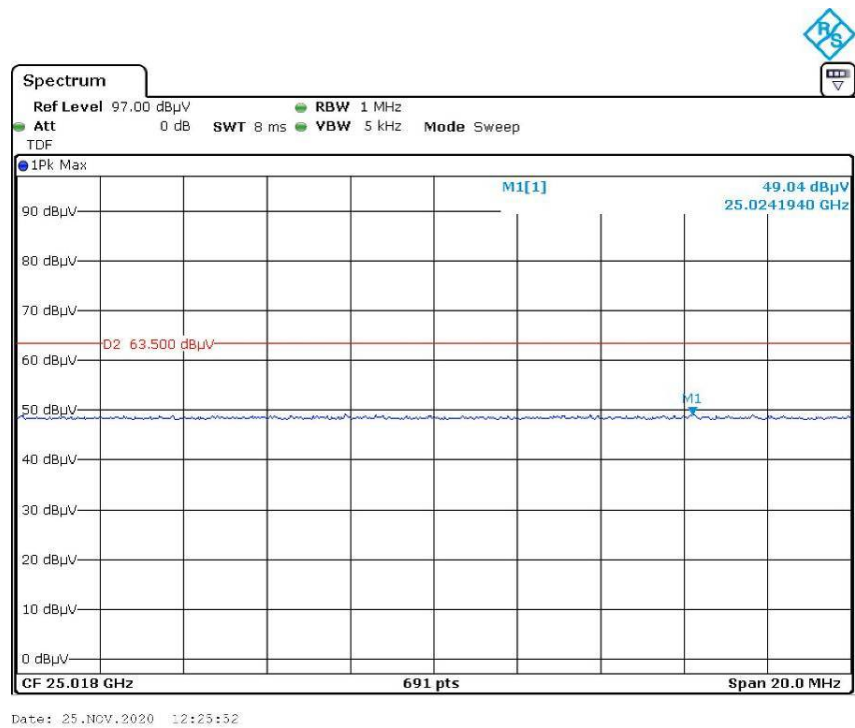
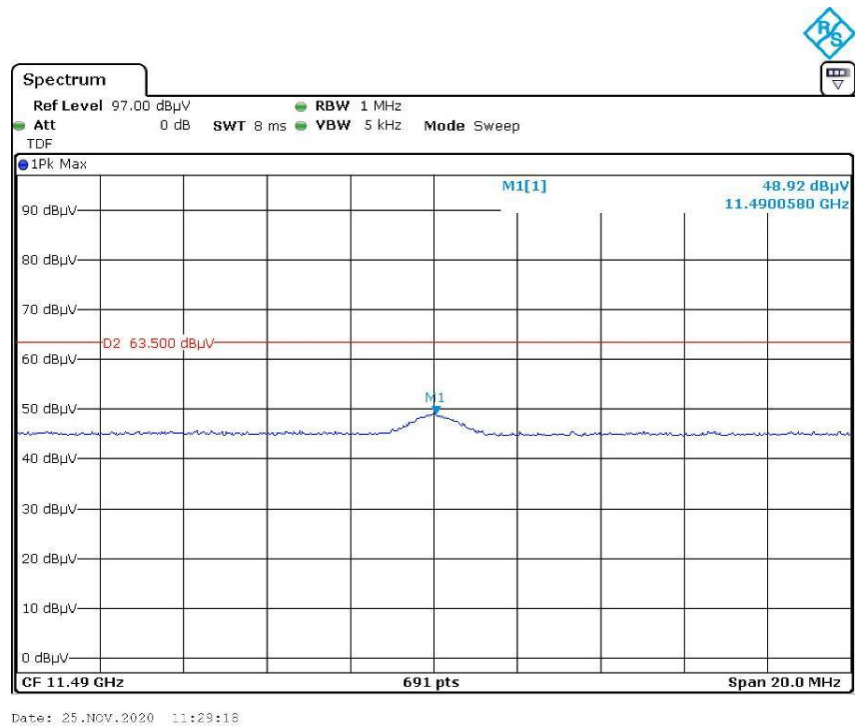


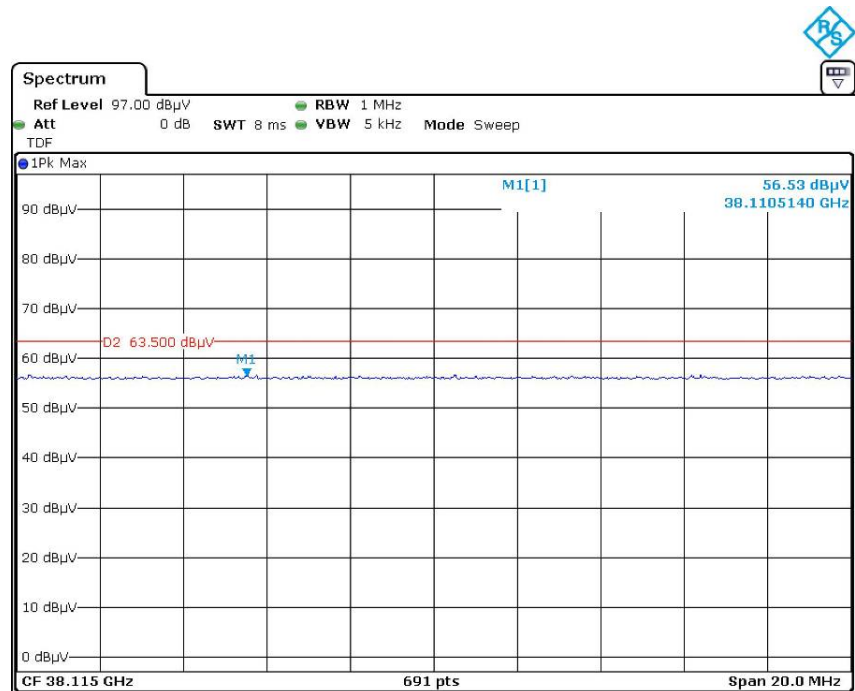
Date: 25.Nov.2020 12:30:19



Date: 25.Nov.2020 12:44:49

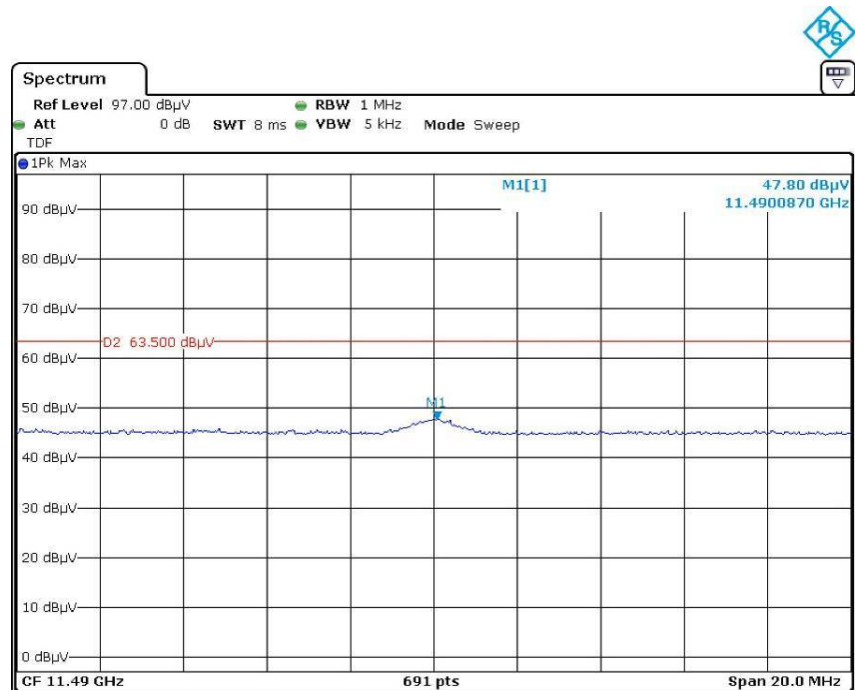
Average Horizontal



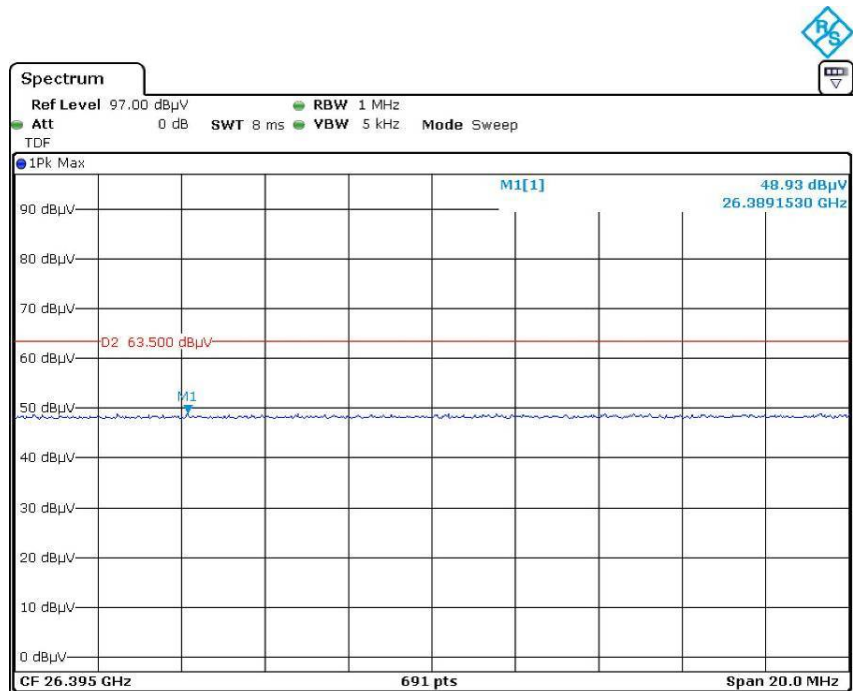


Date: 25.NOV.2020 12:40:48

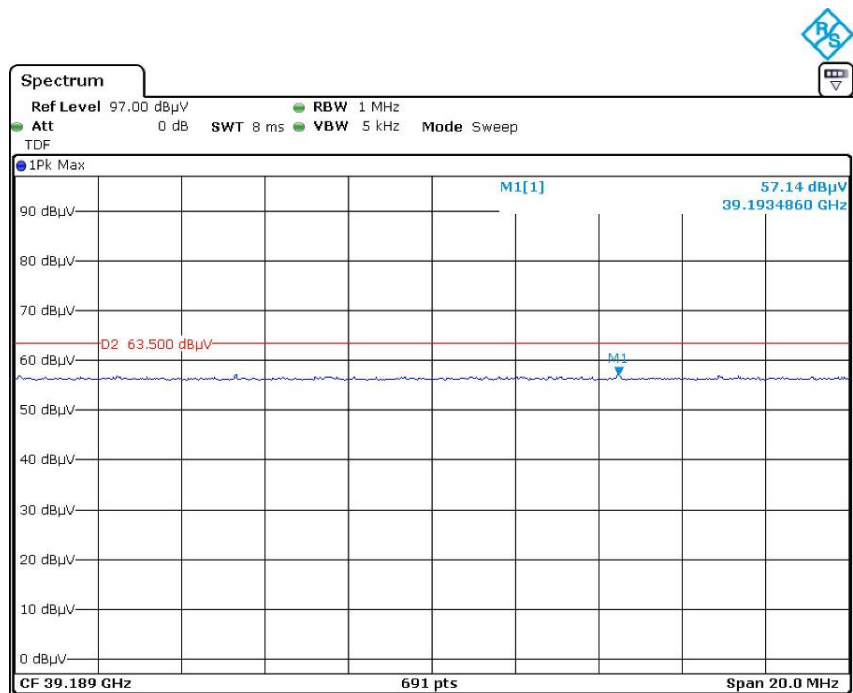
Vertical



Date: 25.NOV.2020 11:20:10



Date: 25.NOV.2020 12:33:41



Date: 25.NOV.2020 12:49:41

FCC §15.407(a) (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.

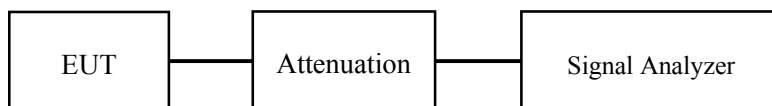
Test Procedure**1. Emission Bandwidth (EBW)**

- 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 5.715-5.85 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao on 2020-12-02 .

EUT operation mode: Transmitting (worst case is MIMO mode)

Test Result: Pass.

Please refer to the Appendix

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

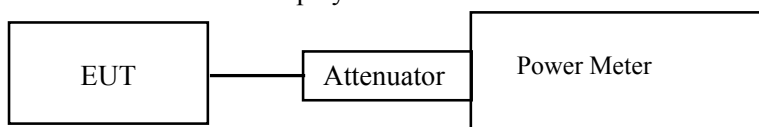
For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao on 2020-12-02 .

EUT operation mode: Transmitting (worst case is MIMO mode)

Test Result: *Pass.*

Please refer to the Appendix

FCC §15.407(a) (1) (3) - POWER SPECTRAL DENSITY

Applicable Standard

(ii) 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 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:	27 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Bravos Zhao on 2020-12-02 .

EUT operation mode: Transmitting (worst case is MIMO mode)

Test Result: Pass.

Please refer to the Appendix

APPENDIX

AppendixA1: Occupied channel bandwidth Test Result

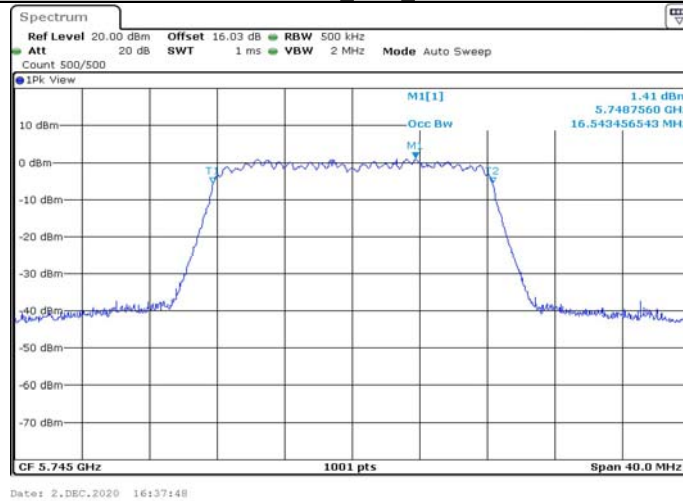
TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11AMIMO	Ant1	5745	16.583	---	PASS
	Ant2	5745	16.543	---	PASS
	Ant1	5785	16.583	---	PASS
	Ant2	5785	16.503	---	PASS
	Ant1	5825	16.543	---	PASS
	Ant2	5825	16.503	---	PASS
11N20MIMO	Ant1	5745	17.702	---	PASS
	Ant2	5745	17.702	---	PASS
	Ant1	5785	17.662	---	PASS
	Ant2	5785	17.662	---	PASS
	Ant1	5825	17.702	---	PASS
	Ant2	5825	17.702	---	PASS
11N40MIMO	Ant1	5755	36.364	---	PASS
	Ant2	5755	36.444	---	PASS
	Ant1	5795	36.284	---	PASS
	Ant2	5795	36.364	---	PASS
11AC20MIMO	Ant1	5745	17.702	---	PASS
	Ant2	5745	17.702	---	PASS
	Ant1	5785	17.702	---	PASS
	Ant2	5785	17.702	---	PASS
	Ant1	5825	17.742	---	PASS
	Ant2	5825	17.702	---	PASS
11AC40MIMO	Ant1	5755	36.603	---	PASS
	Ant2	5755	36.523	---	PASS
	Ant1	5795	36.763	---	PASS
	Ant2	5795	36.683	---	PASS
11AC80MIMO	Ant1	5775	74.805	---	PASS
	Ant2	5775	74.486	---	PASS

Test Graphs

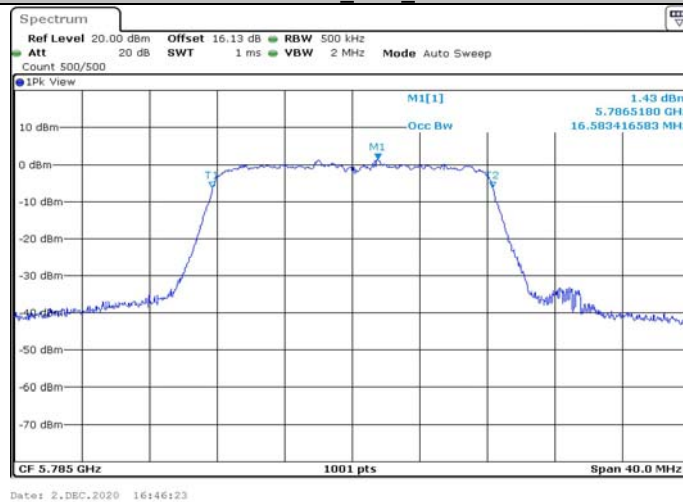
11AMIMO_Ant1_5745

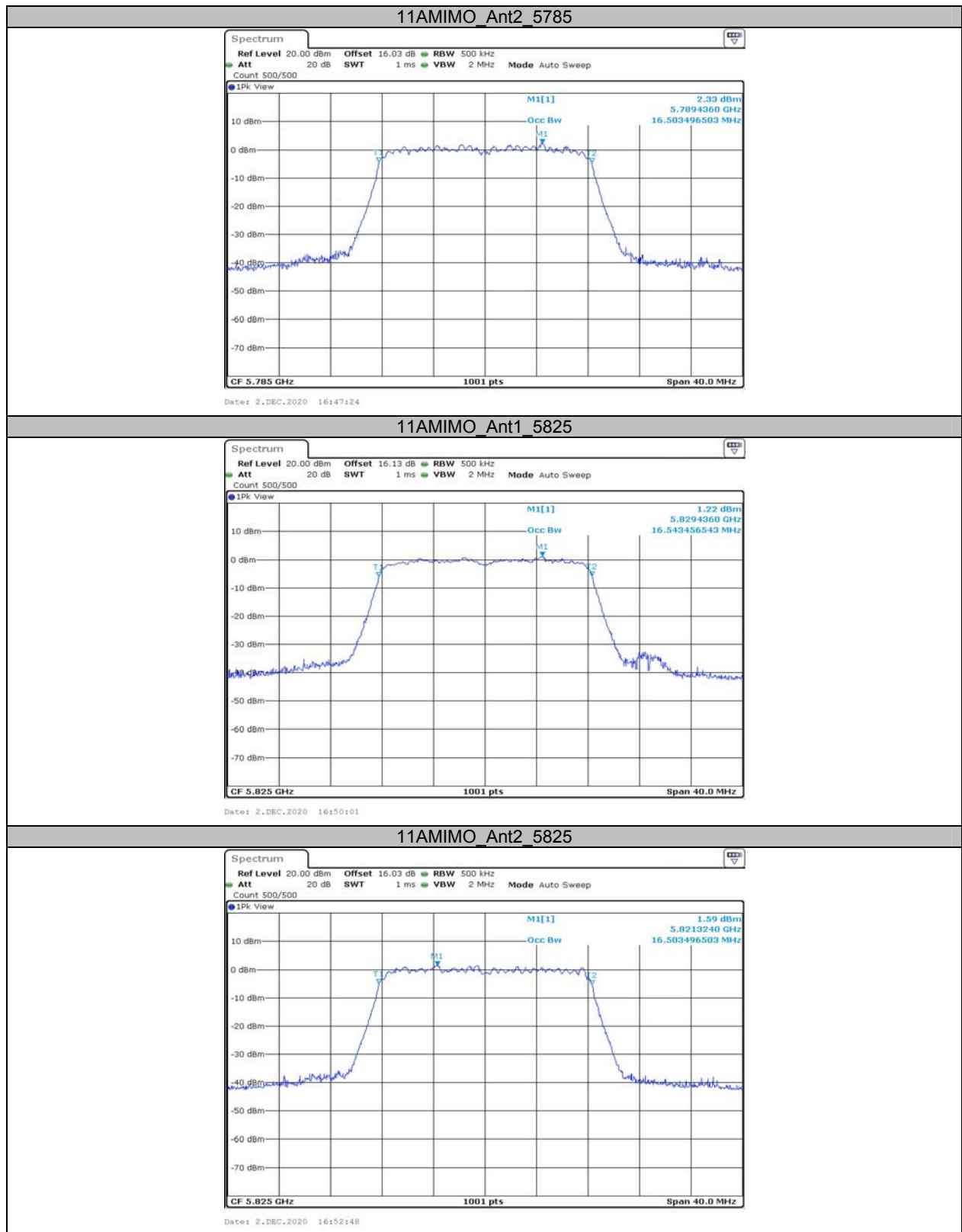


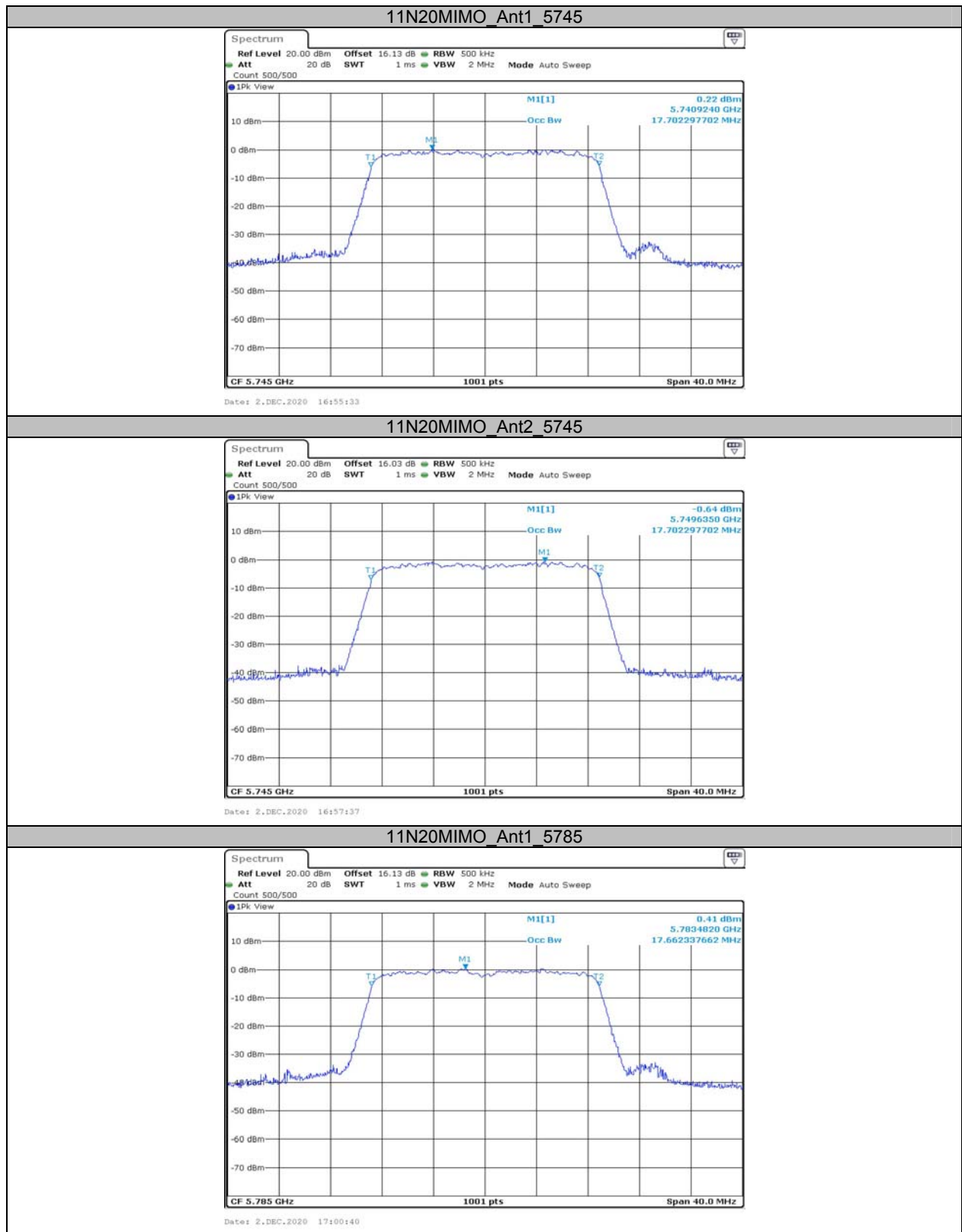
11AMIMO_Ant2_5745

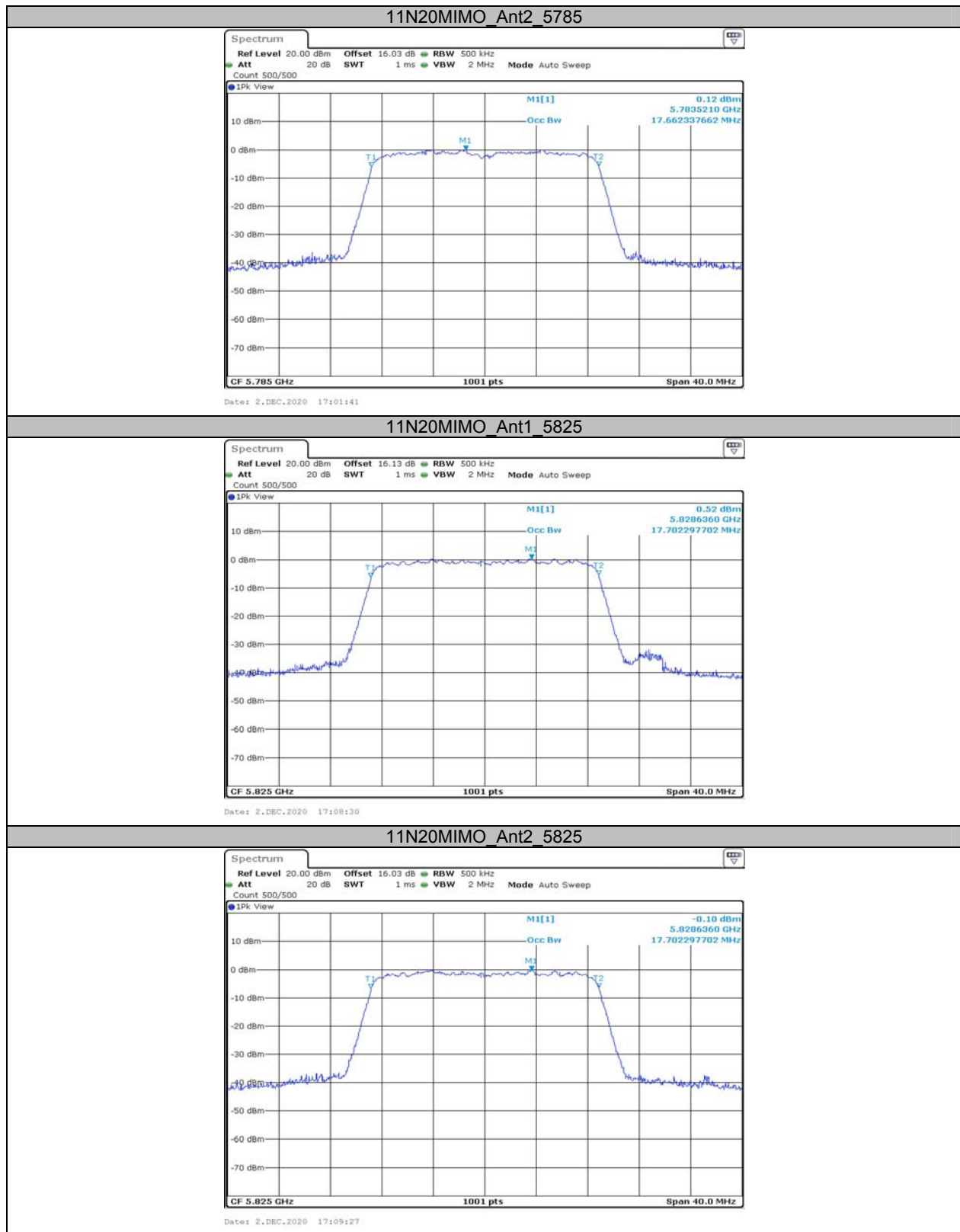


11AMIMO_Ant1_5785









11N40MIMO_Ant1_5755



11N40MIMO_Ant2_5755



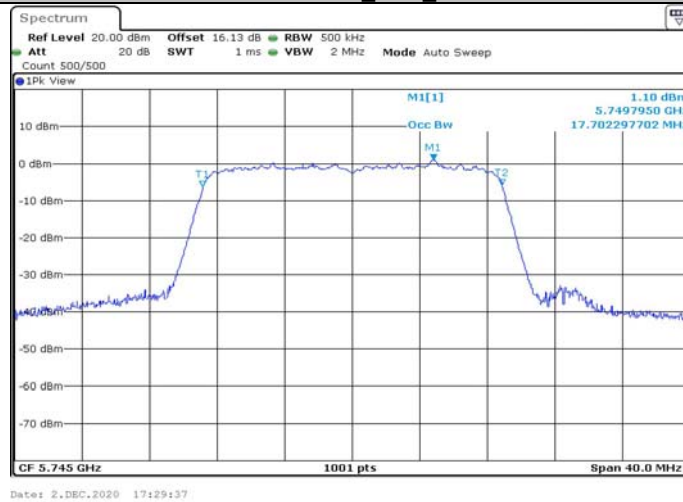
11N40MIMO_Ant1_5795



11N40MIMO_Ant2_5795



11AC20MIMO_Ant1_5745



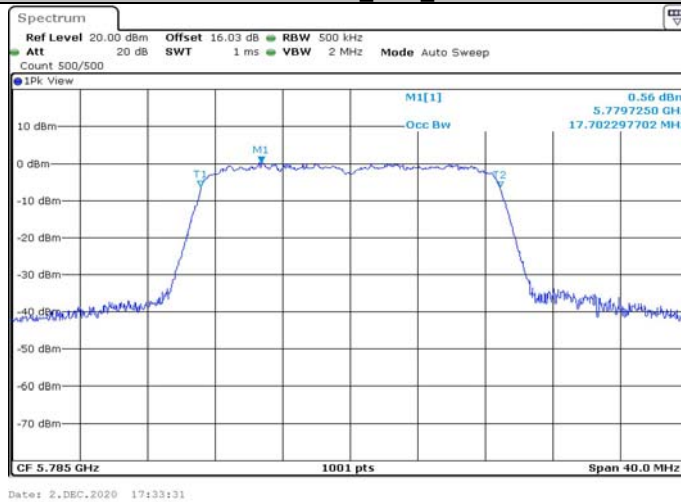
11AC20MIMO_Ant2_5745



11AC20MIMO_Ant1_5785

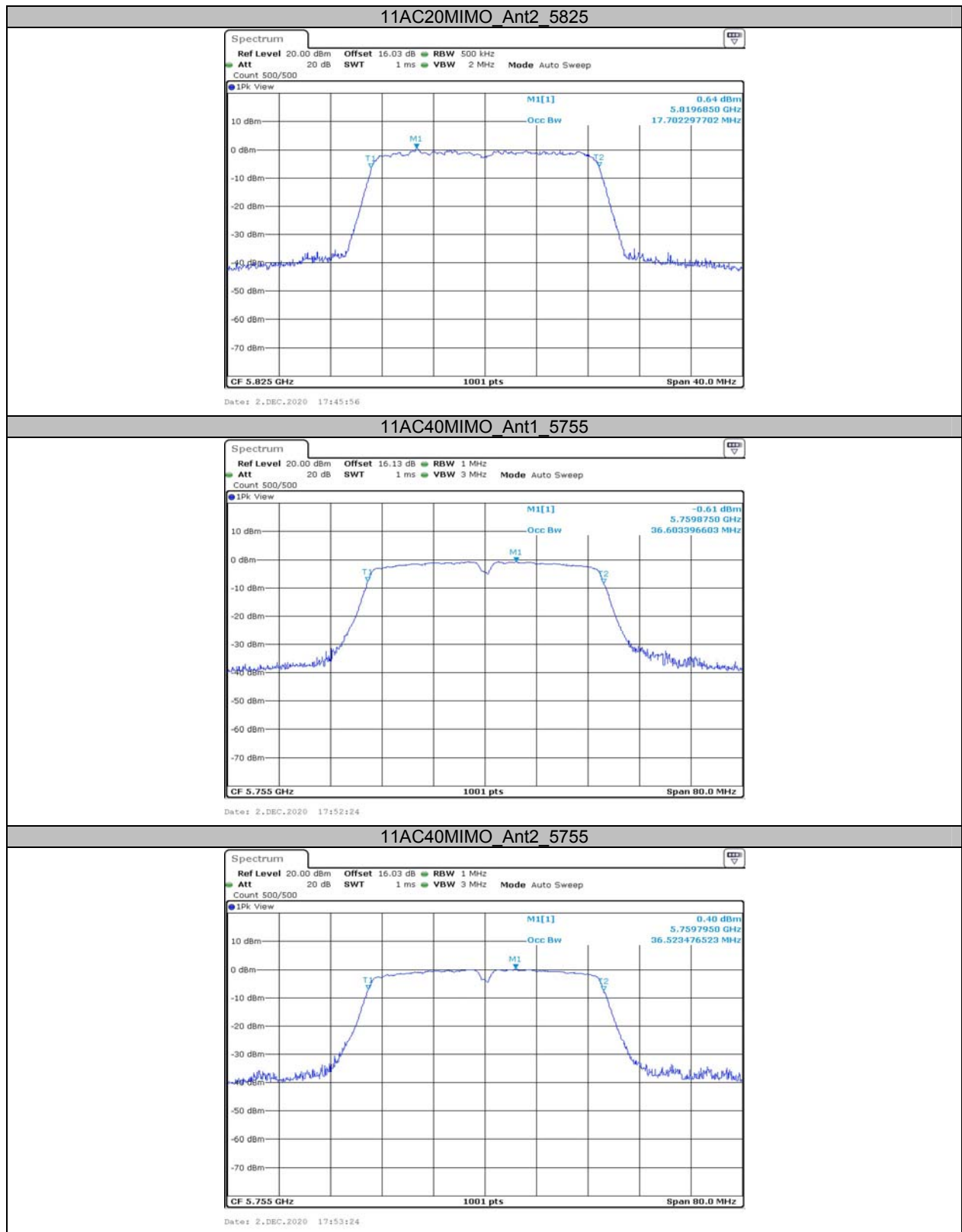


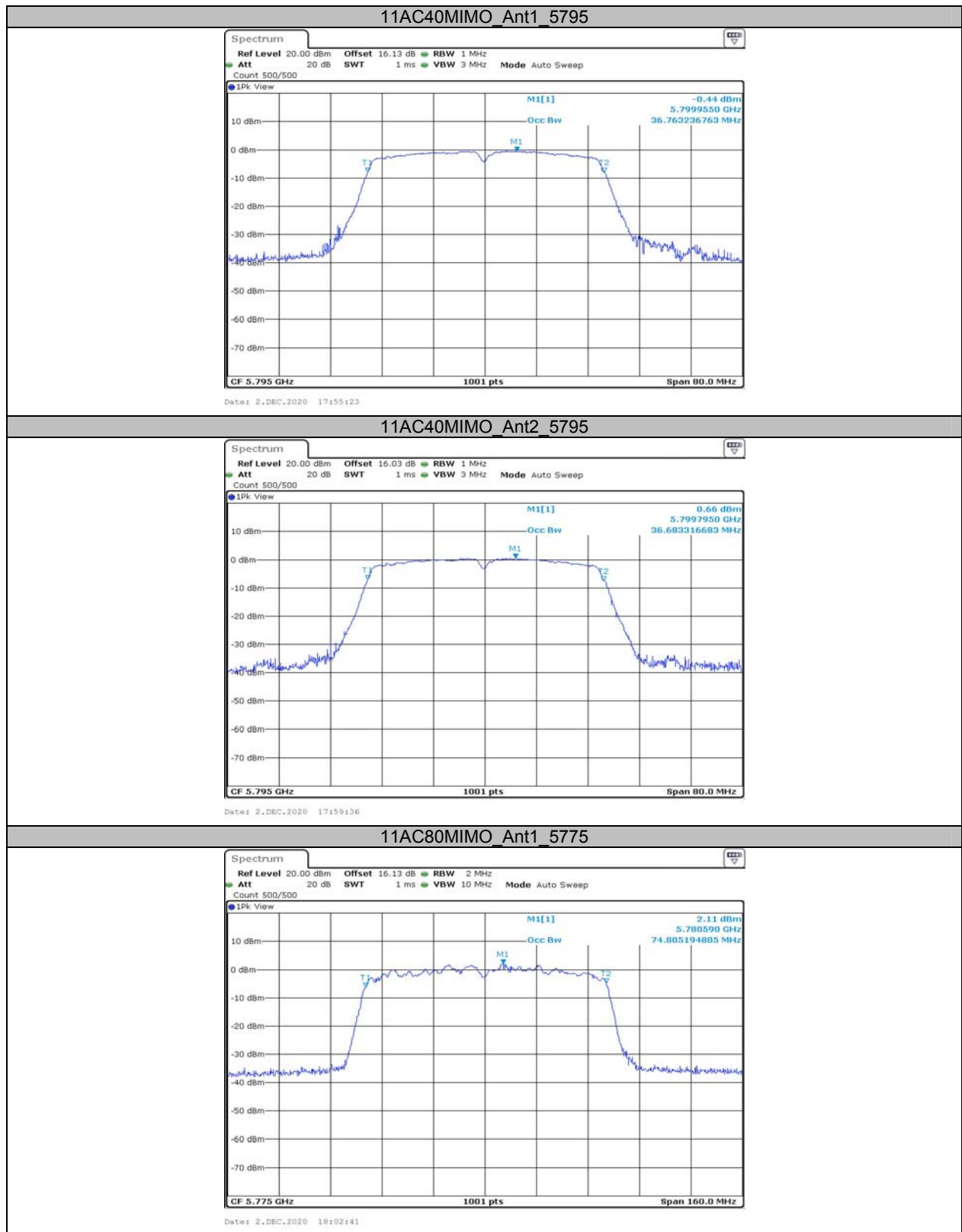
11AC20MIMO_Ant2_5785

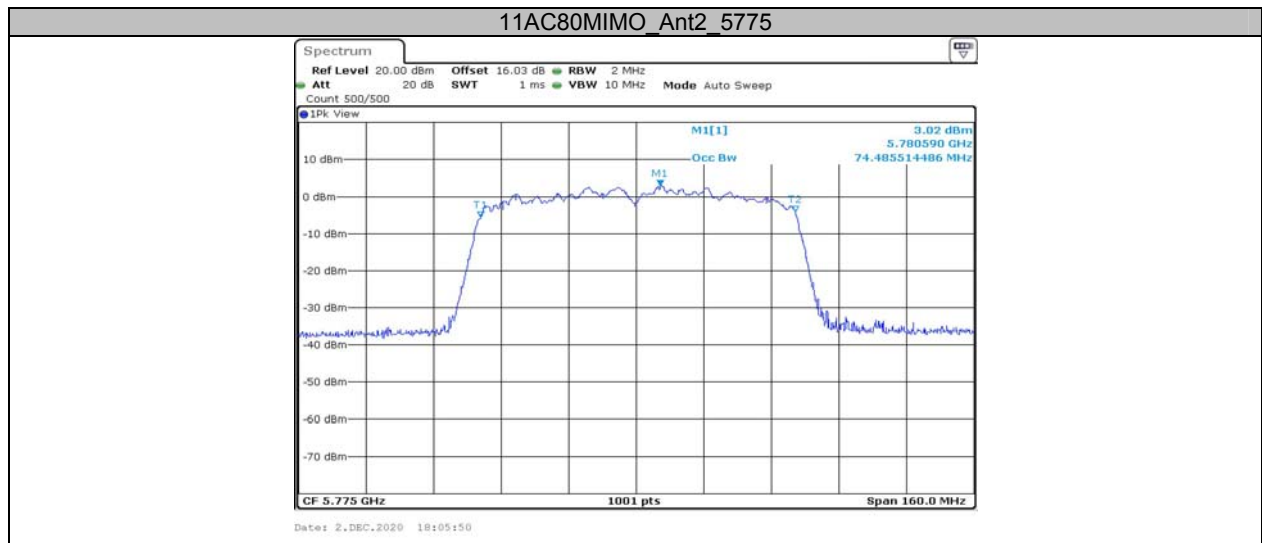


11AC20MIMO_Ant1_5825







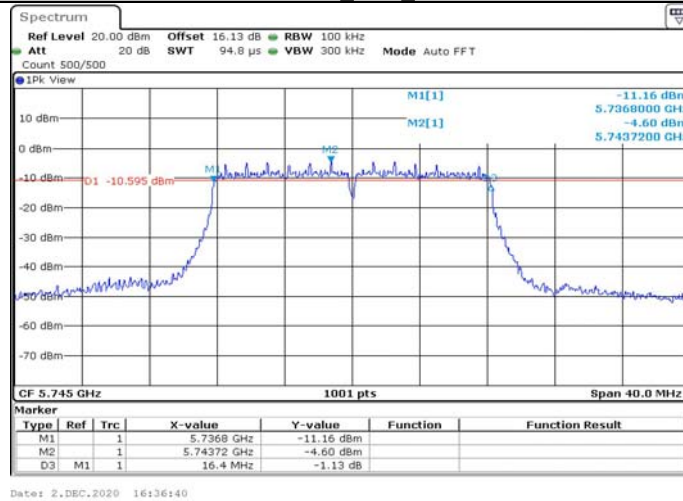


AppendixA2: Min emission bandwidth Test Result

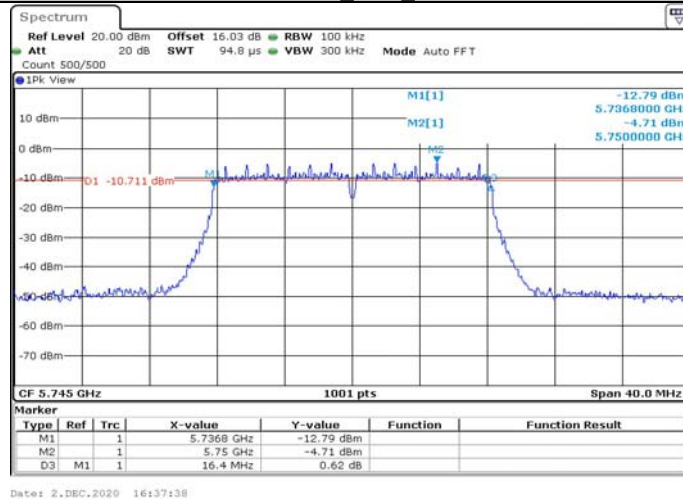
TestMode	Antenna	Channel	6db EBW [MHz]	Limit[MHz]	Verdict
11AMIMO	Ant1	5745	16.400	0.5	PASS
	Ant2	5745	16.400	0.5	PASS
	Ant1	5785	16.400	0.5	PASS
	Ant2	5785	16.400	0.5	PASS
	Ant1	5825	16.400	0.5	PASS
	Ant2	5825	16.400	0.5	PASS
11N20MIMO	Ant1	5745	17.600	0.5	PASS
	Ant2	5745	17.240	0.5	PASS
	Ant1	5785	17.640	0.5	PASS
	Ant2	5785	17.640	0.5	PASS
	Ant1	5825	17.640	0.5	PASS
	Ant2	5825	17.400	0.5	PASS
11N40MIMO	Ant1	5755	35.280	0.5	PASS
	Ant2	5755	35.280	0.5	PASS
	Ant1	5795	35.280	0.5	PASS
	Ant2	5795	35.280	0.5	PASS
11AC20MIMO	Ant1	5745	17.600	0.5	PASS
	Ant2	5745	17.600	0.5	PASS
	Ant1	5785	17.600	0.5	PASS
	Ant2	5785	17.600	0.5	PASS
	Ant1	5825	17.600	0.5	PASS
	Ant2	5825	17.680	0.5	PASS
11AC40MIMO	Ant1	5755	35.280	0.5	PASS
	Ant2	5755	35.280	0.5	PASS
	Ant1	5795	35.280	0.5	PASS
	Ant2	5795	35.280	0.5	PASS
11AC80MIMO	Ant1	5775	75.520	0.5	PASS
	Ant2	5775	74.240	0.5	PASS

Test Graphs

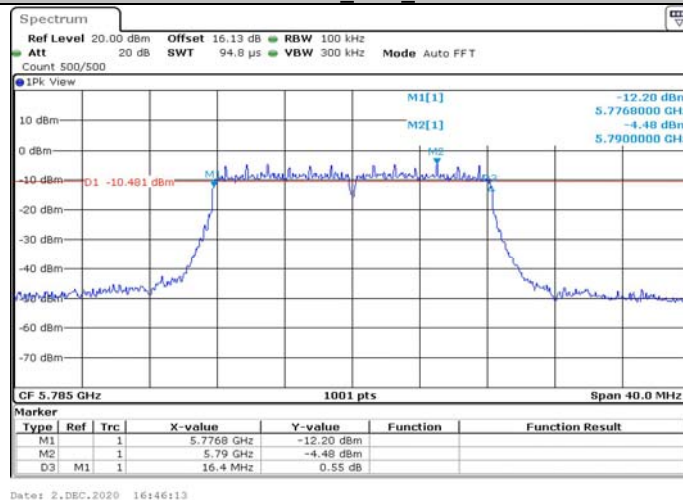
11AMIMO_Ant1_5745



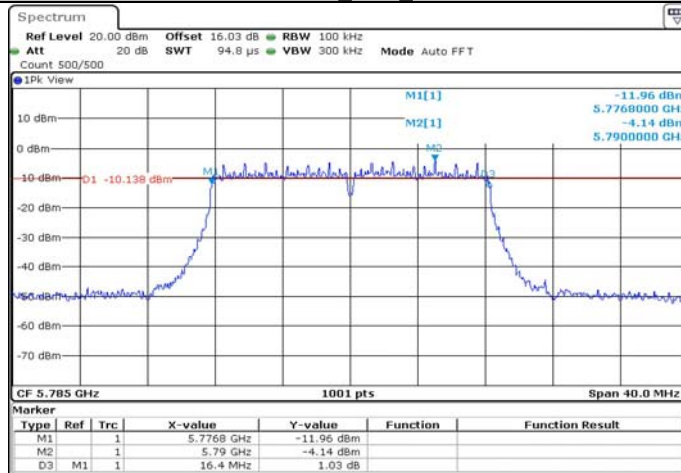
11AMIMO_Ant2_5745



11AMIMO_Ant1_5785

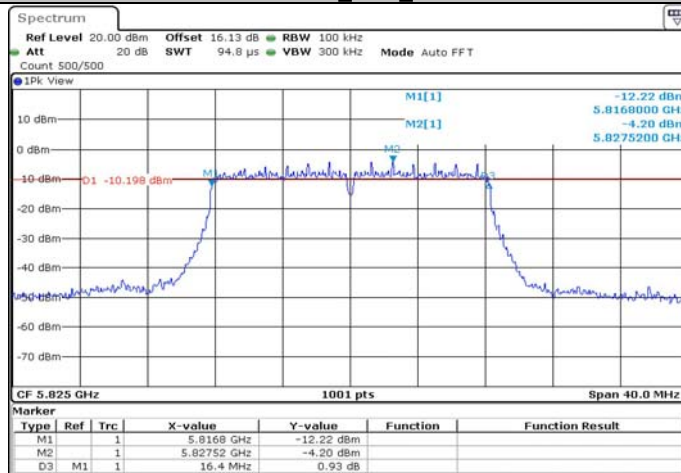


11AMIMO_Ant2_5785



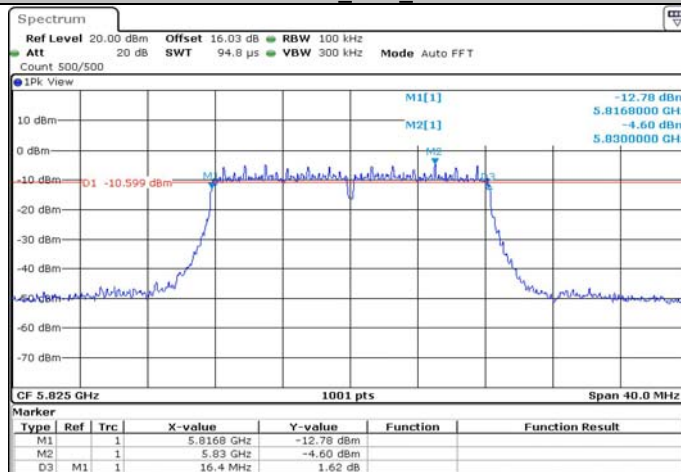
Date: 2, DEC, 2020 16:47:13

11AMIMO_Ant1_5825

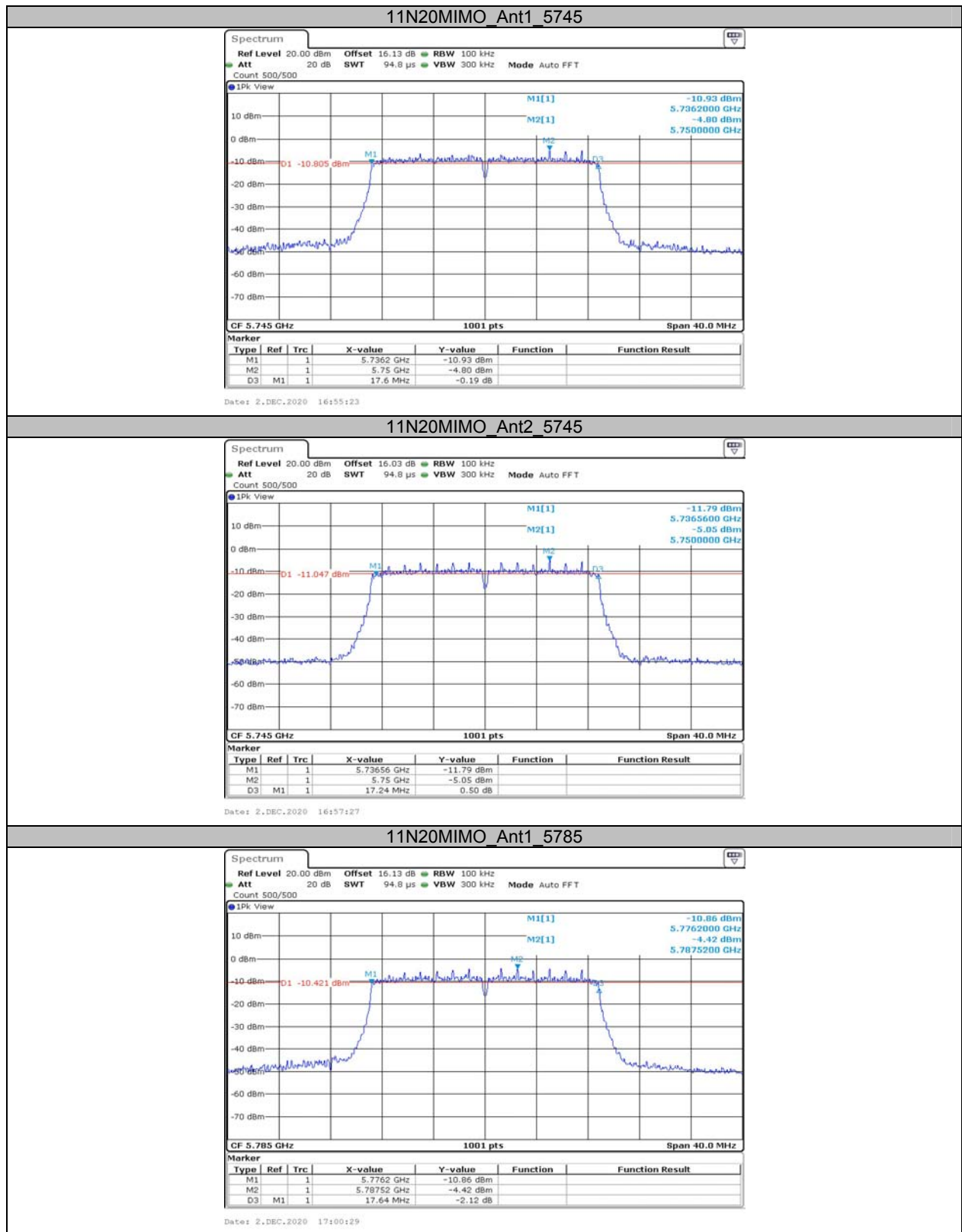


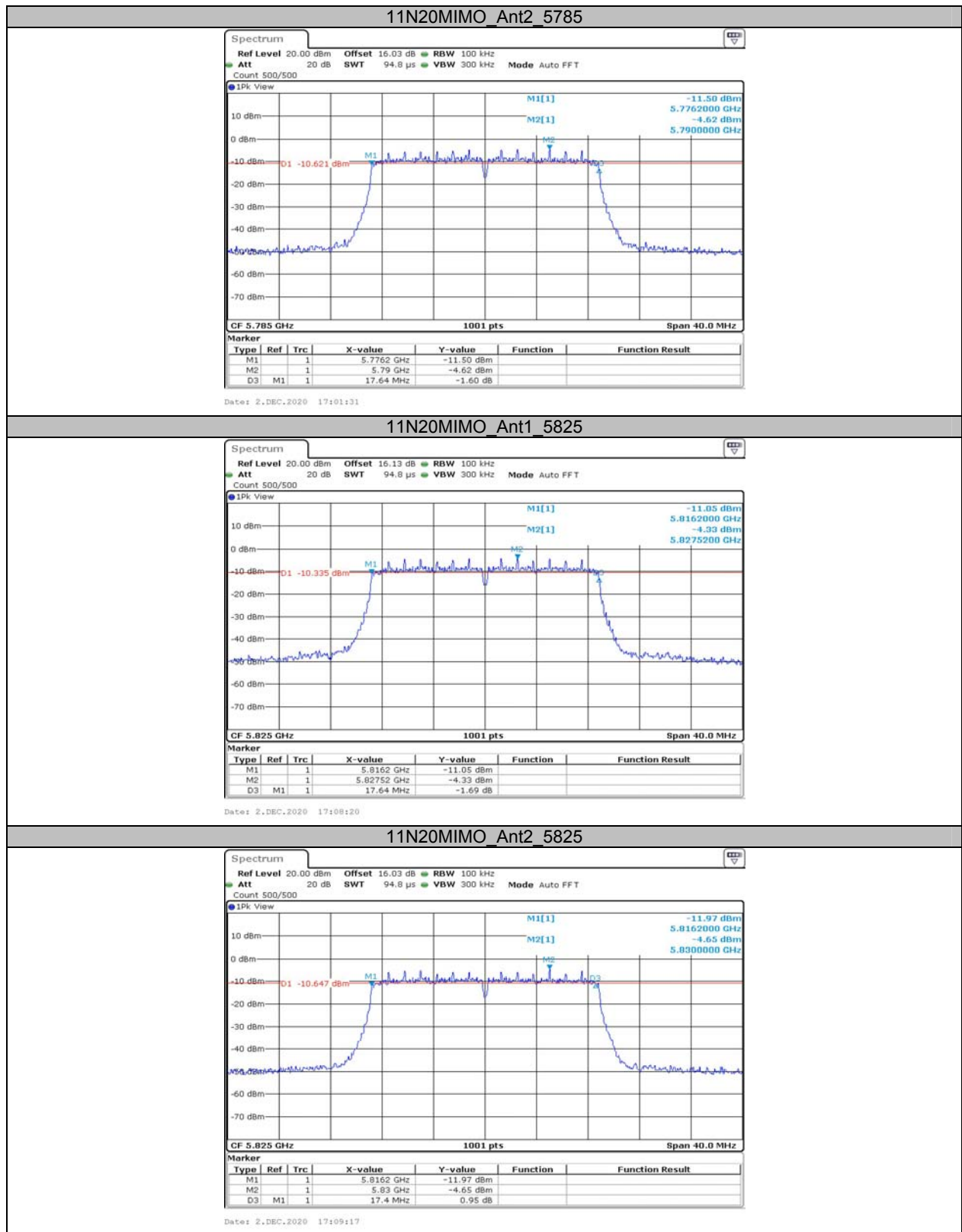
Date: 2, DEC, 2020 16:49:51

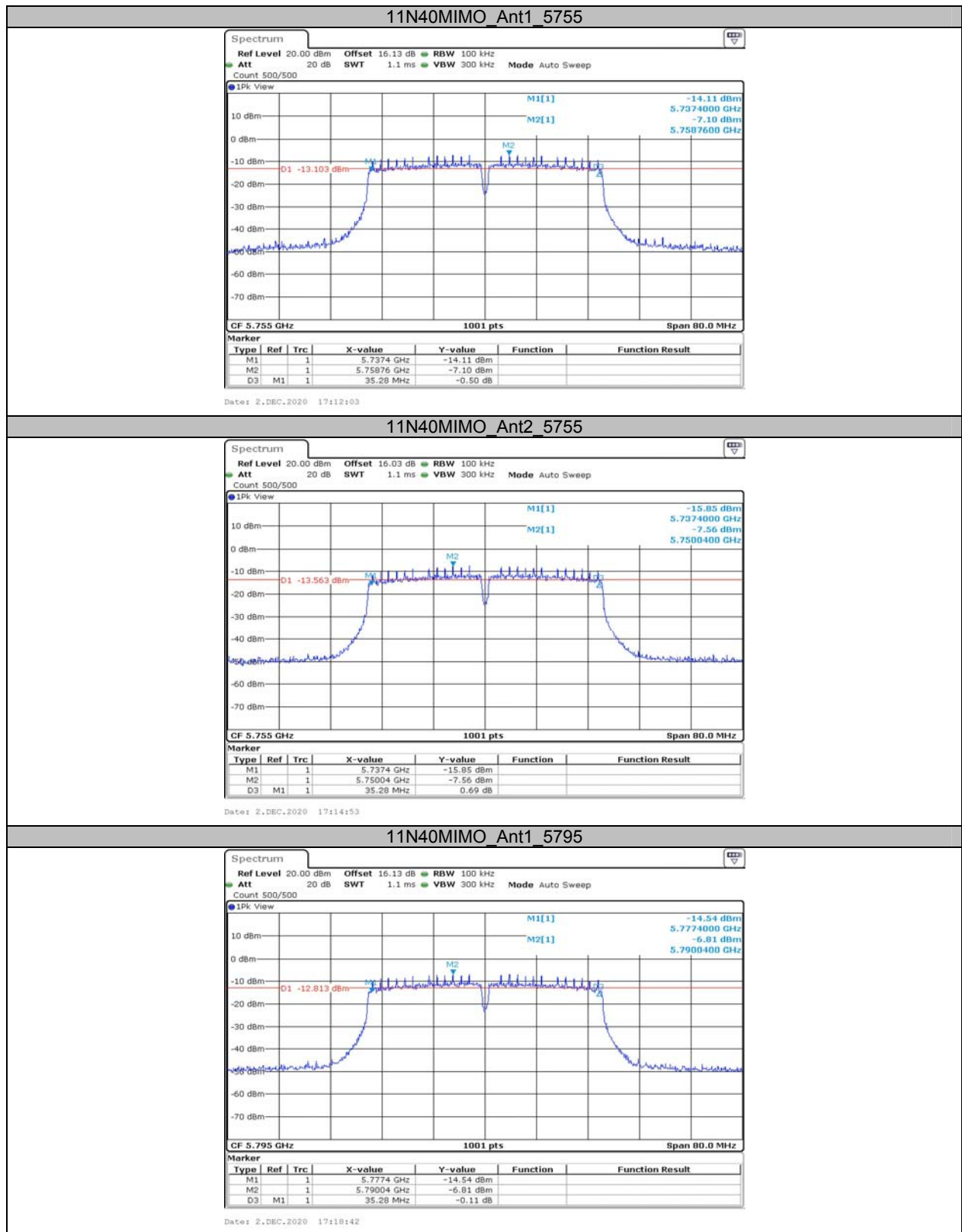
11AMIMO_Ant2_5825



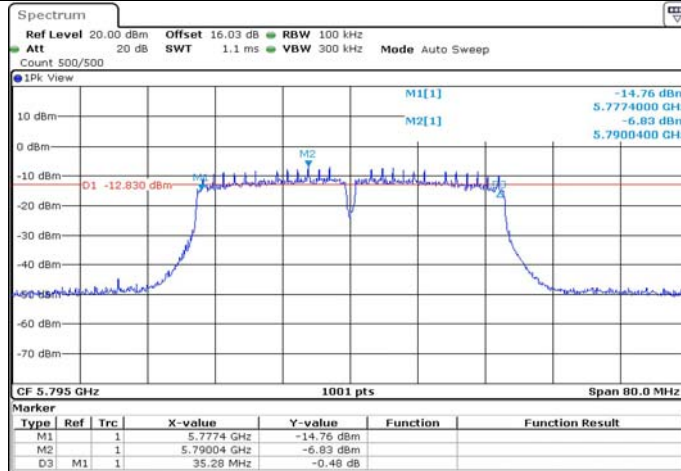
Date: 2, DEC, 2020 16:52:37





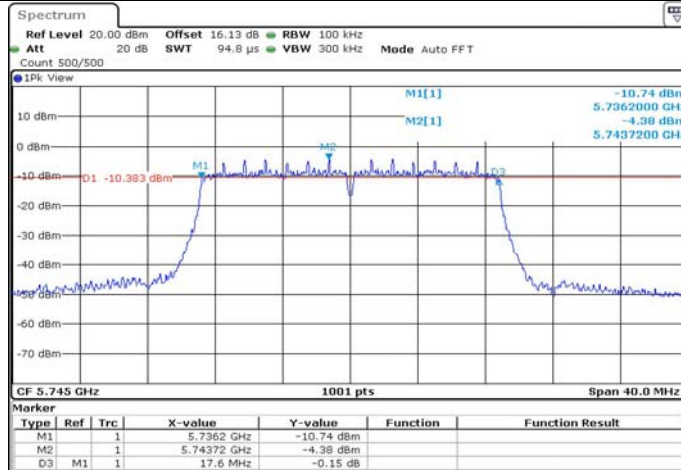


11N40MIMO_Ant2_5795



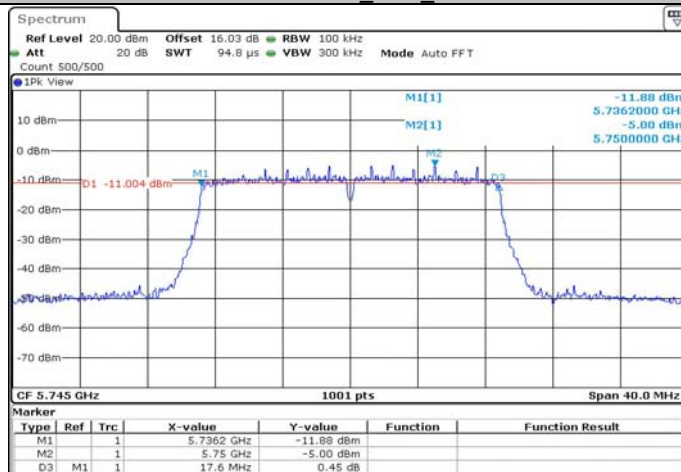
Date: 2.DEC.2020 17:20:30

11AC20MIMO_Ant1_5745



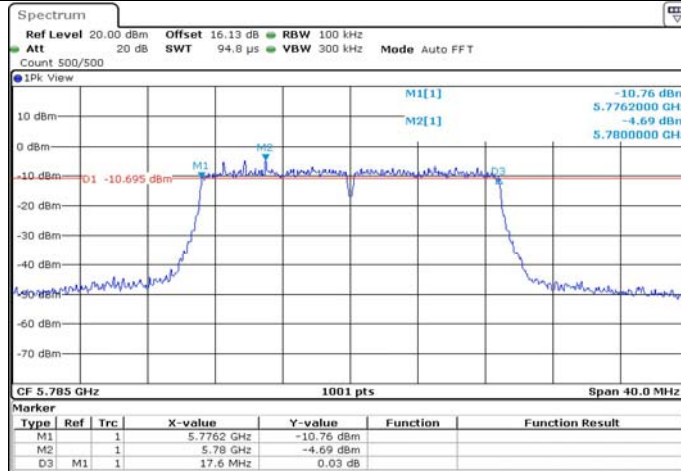
Date: 2.DEC.2020 17:29:27

11AC20MIMO_Ant2_5745



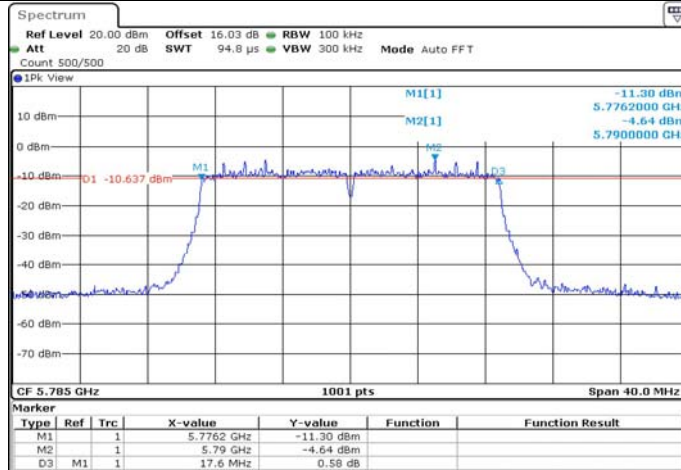
Date: 2.DEC.2020 17:30:23

11AC20MIMO Ant1_5785



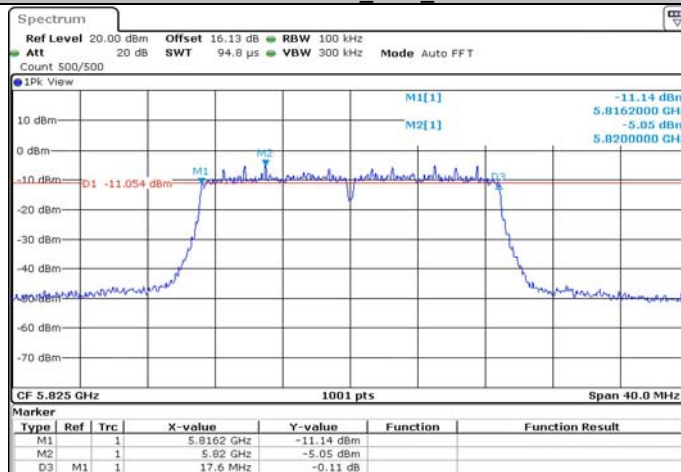
Date: 2.DEC.2020 17:32:20

11AC20MIMO Ant2_5785



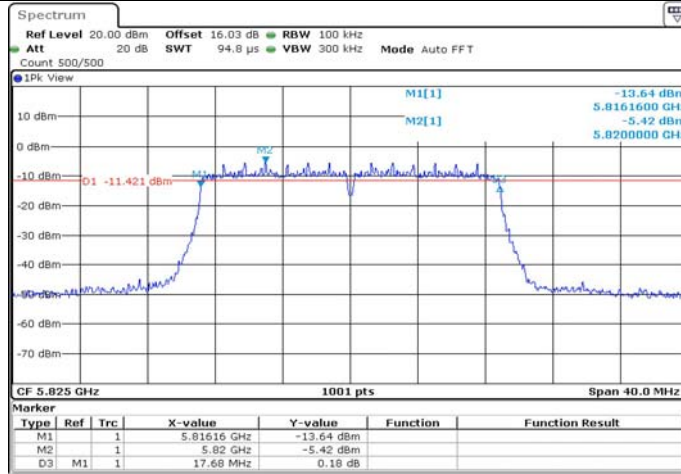
Date: 2.DEC.2020 17:33:21

11AC20MIMO Ant1_5825



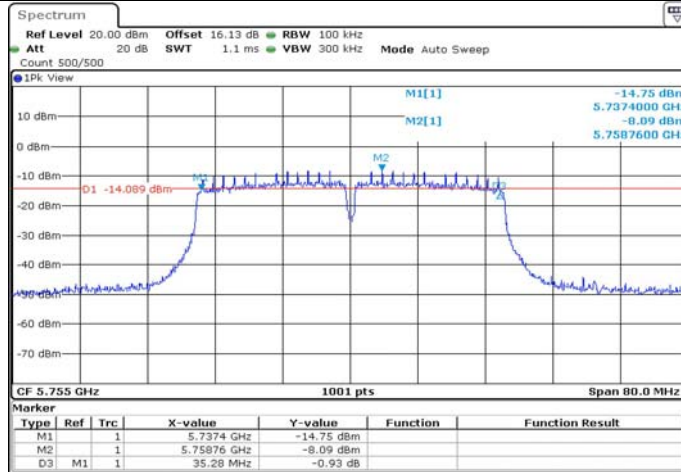
Date: 2.DEC.2020 17:44:42

11AC20MIMO Ant2_5825



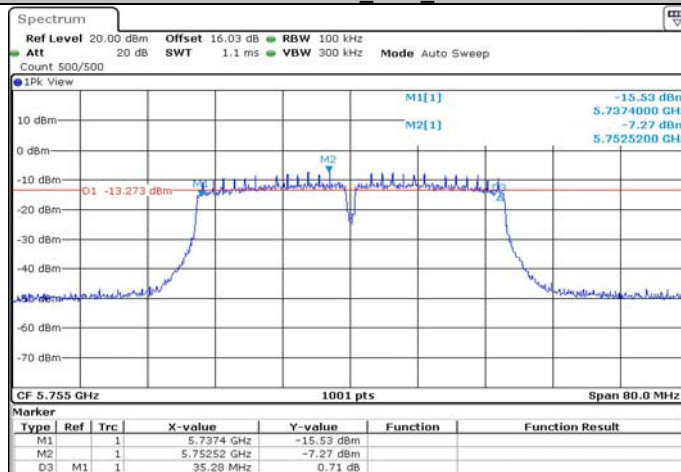
Date: 2.DEC.2020 17:45:46

11AC40MIMO Ant1_5755



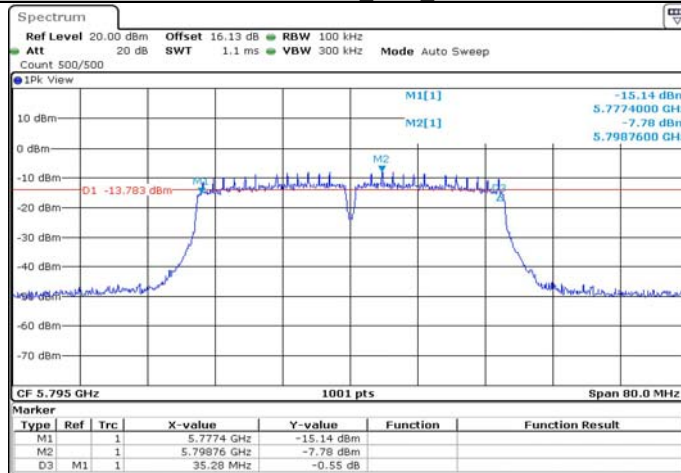
Date: 2.DEC.2020 17:52:14

11AC40MIMO Ant2_5755



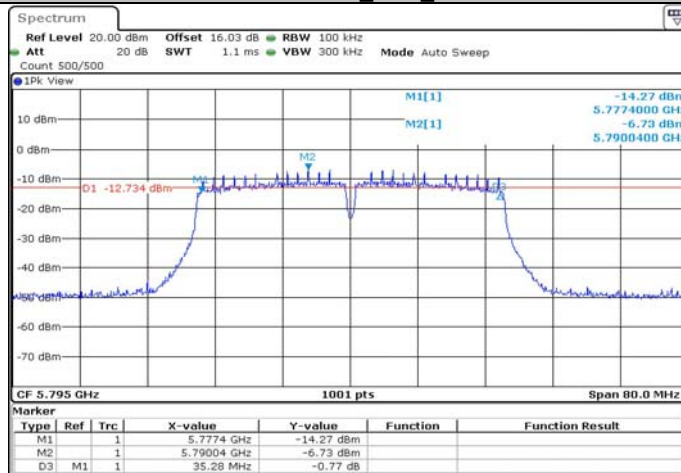
Date: 2.DEC.2020 17:53:14

11AC40MIMO Ant1_5795



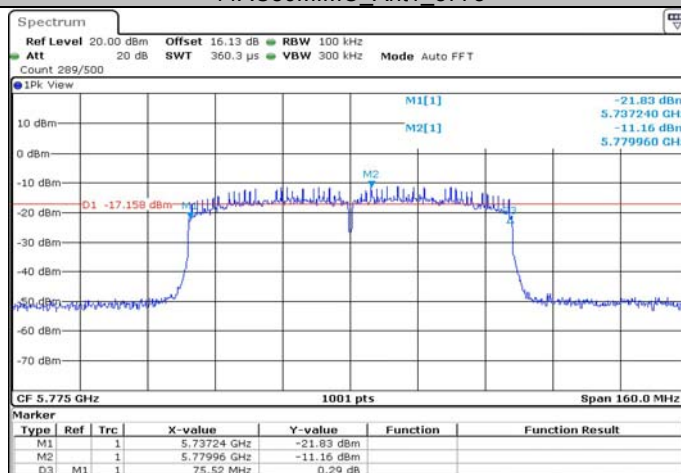
Date: 2.DEC.2020 17:55:13

11AC40MIMO Ant2_5795

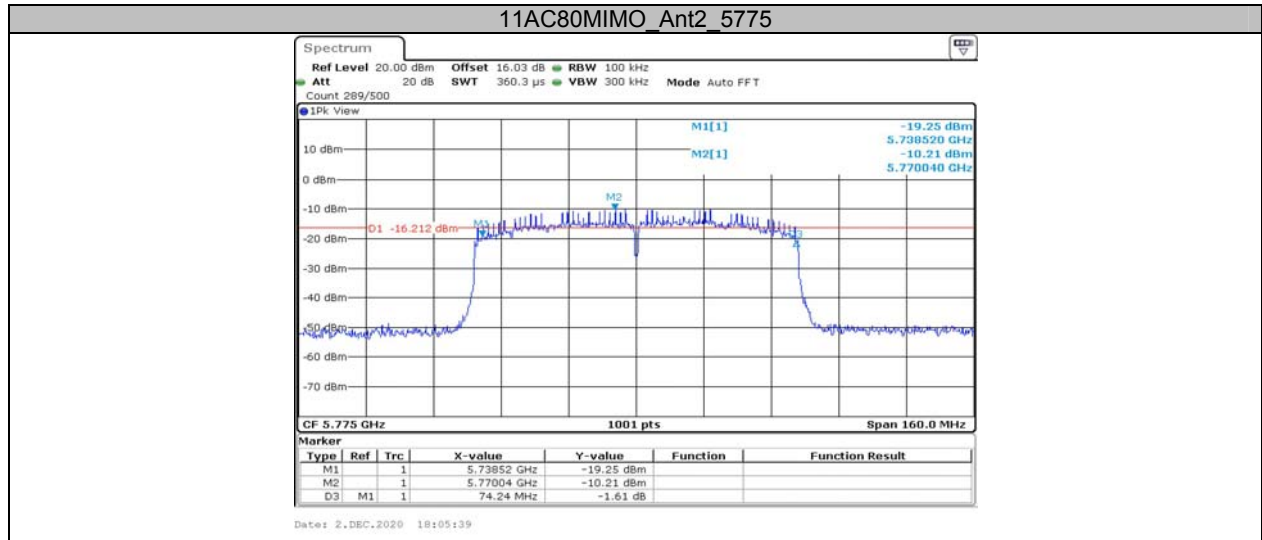


Date: 2.DEC.2020 17:59:26

11AC80MIMO Ant1_5775



Date: 2.DEC.2020 18:02:31



AppendixB: Maximum conducted output power**Test Result**

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11AMIMO	Ant1	5745	6.96	<=30	PASS
	Ant2	5745	7.26	<=30	PASS
	total	5745	10.12	<=30	PASS
	Ant1	5785	6.87	<=30	PASS
	Ant2	5785	7.85	<=30	PASS
	total	5785	10.40	<=30	PASS
	Ant1	5825	7.18	<=30	PASS
	Ant2	5825	7.42	<=30	PASS
11N20MIMO	total	5825	10.31	<=30	PASS
	Ant1	5745	6.84	<=30	PASS
	Ant2	5745	7.18	<=30	PASS
	total	5745	10.02	<=30	PASS
	Ant1	5785	6.87	<=30	PASS
	Ant2	5785	7.82	<=30	PASS
	total	5785	10.38	<=30	PASS
	Ant1	5825	7.08	<=30	PASS
11N40MIMO	Ant2	5825	7.32	<=30	PASS
	total	5825	10.22	<=30	PASS
	Ant1	5755	6.60	<=30	PASS
	Ant2	5755	7.00	<=30	PASS
	total	5755	9.81	<=30	PASS
	Ant1	5795	6.41	<=30	PASS
11AC20MIMO	Ant2	5795	7.27	<=30	PASS
	total	5795	9.87	<=30	PASS
	Ant1	5745	6.98	<=30	PASS
	Ant2	5745	7.19	<=30	PASS
	total	5745	10.09	<=30	PASS
	Ant1	5785	7.05	<=30	PASS
	Ant2	5785	7.83	<=30	PASS
	total	5785	10.47	<=30	PASS
11AC40MIMO	Ant1	5825	7.21	<=30	PASS
	Ant2	5825	7.44	<=30	PASS
	total	5825	10.34	<=30	PASS
	Ant1	5755	6.58	<=30	PASS
	Ant2	5755	6.84	<=30	PASS
	total	5755	9.72	<=30	PASS
11AC80MIMO	Ant1	5795	6.41	<=30	PASS
	Ant2	5795	7.15	<=30	PASS
	total	5795	9.81	<=30	PASS
11AC80MIMO	Ant1	5775	5.81	<=30	PASS
	Ant2	5775	6.46	<=30	PASS
	total	5775	9.16	<=30	PASS

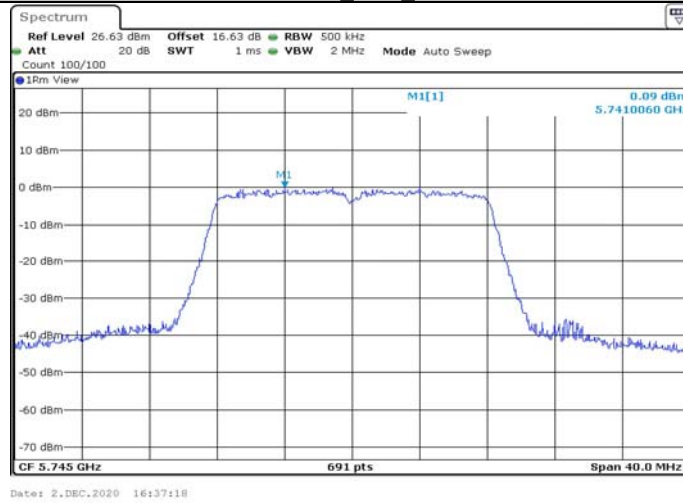
AppendixC: Maximum power spectral density Test Result

TestMode	Antenna	Channel	Result [dBm/500kHz]	Limit[dBm/500kHz]	Verdict
11AMIMO	Ant1	5745	0.09	<=30	PASS
	Ant2	5745	0.09	<=30	PASS
	total	5745	3.10	<=30	PASS
	Ant1	5785	0.56	<=30	PASS
	Ant2	5785	0.62	<=30	PASS
	total	5785	3.60	<=30	PASS
	Ant1	5825	0.14	<=30	PASS
	Ant2	5825	0.15	<=30	PASS
11N20MIMO	total	5825	3.16	<=30	PASS
	Ant1	5745	-0.23	<=30	PASS
	Ant2	5745	-1.05	<=30	PASS
	total	5745	2.39	<=30	PASS
	Ant1	5785	-0.24	<=30	PASS
	Ant2	5785	-0.85	<=30	PASS
	total	5785	2.48	<=30	PASS
	Ant1	5825	-0.47	<=30	PASS
11N40MIMO	Ant2	5825	-0.96	<=30	PASS
	total	5825	2.30	<=30	PASS
	Ant1	5755	-3.2	<=30	PASS
	Ant2	5755	-3.33	<=30	PASS
	total	5755	-0.25	<=30	PASS
	Ant1	5795	-2.32	<=30	PASS
11AC20MIMO	Ant2	5795	-3.4	<=30	PASS
	total	5795	0.18	<=30	PASS
	Ant1	5745	-0.27	<=30	PASS
	Ant2	5745	-0.77	<=30	PASS
	total	5745	2.50	<=30	PASS
	Ant1	5785	-0.03	<=30	PASS
	Ant2	5785	-0.38	<=30	PASS
	total	5785	2.81	<=30	PASS
11AC40MIMO	Ant1	5825	-0.92	<=30	PASS
	Ant2	5825	-0.1	<=30	PASS
	total	5825	2.52	<=30	PASS
	Ant1	5755	-4.23	<=30	PASS
	Ant2	5755	-3.21	<=30	PASS
	total	5755	-0.68	<=30	PASS
11AC80MIMO	Ant1	5795	-4.54	<=30	PASS
	Ant2	5795	-2.34	<=30	PASS
	total	5795	-0.29	<=30	PASS
	Ant1	5775	-6.16	<=30	PASS
	Ant2	5775	-5.67	<=30	PASS
11AC80MIMO	total	5775	-2.90	<=30	PASS

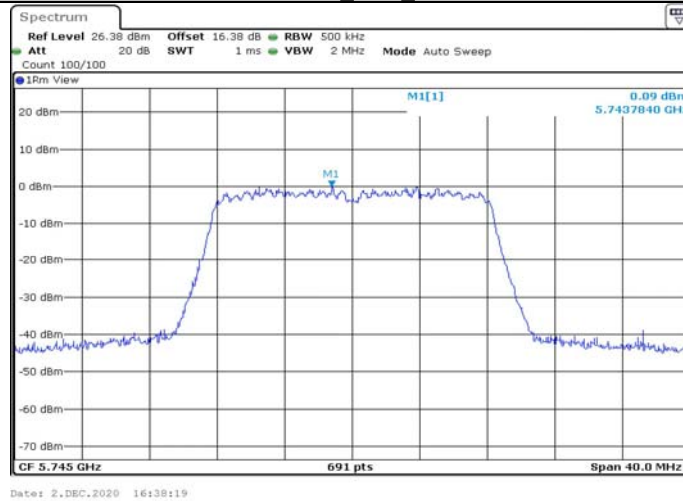
Note: The Duty Cycle Factor is compensated in the graph.

Test Graphs

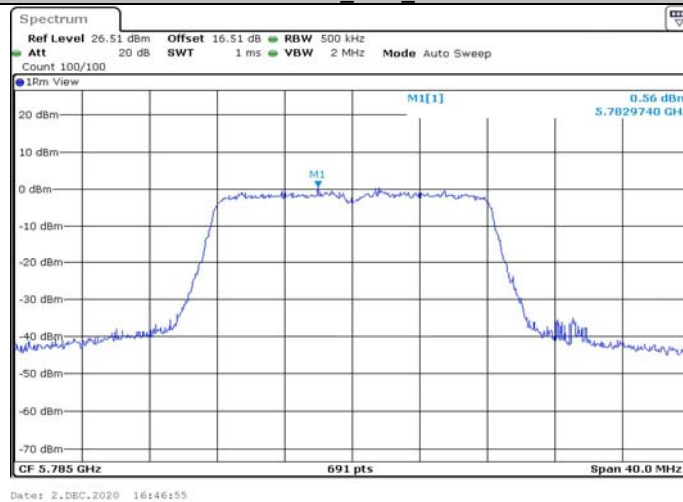
11AMIMO_Ant1_5745



11AMIMO_Ant2_5745



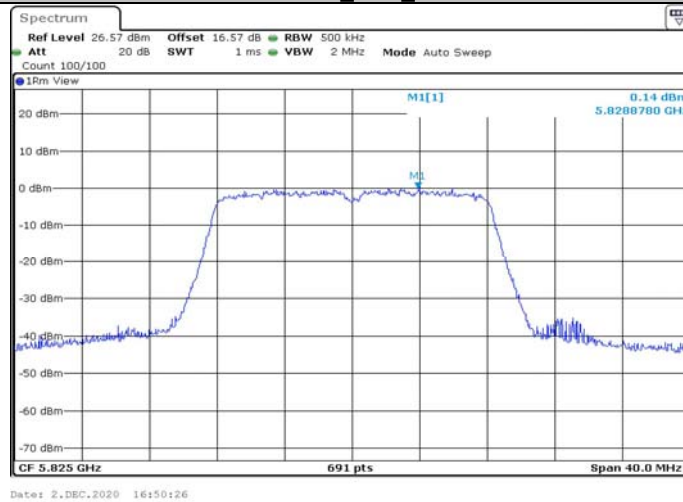
11AMIMO_Ant1_5785



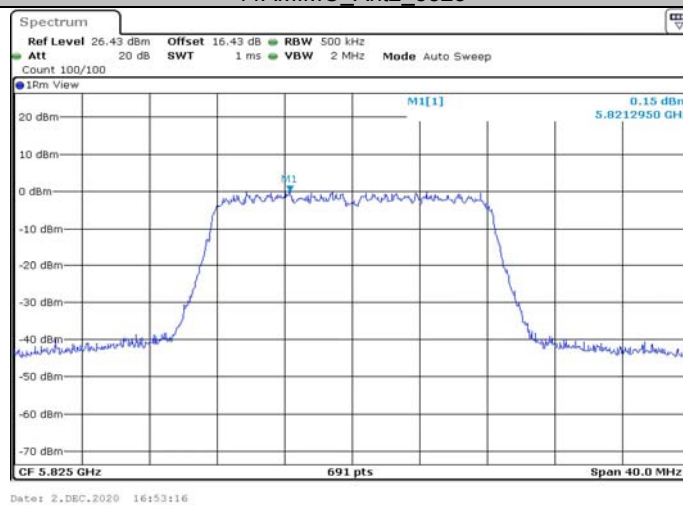
11AMIMO_Ant2_5785

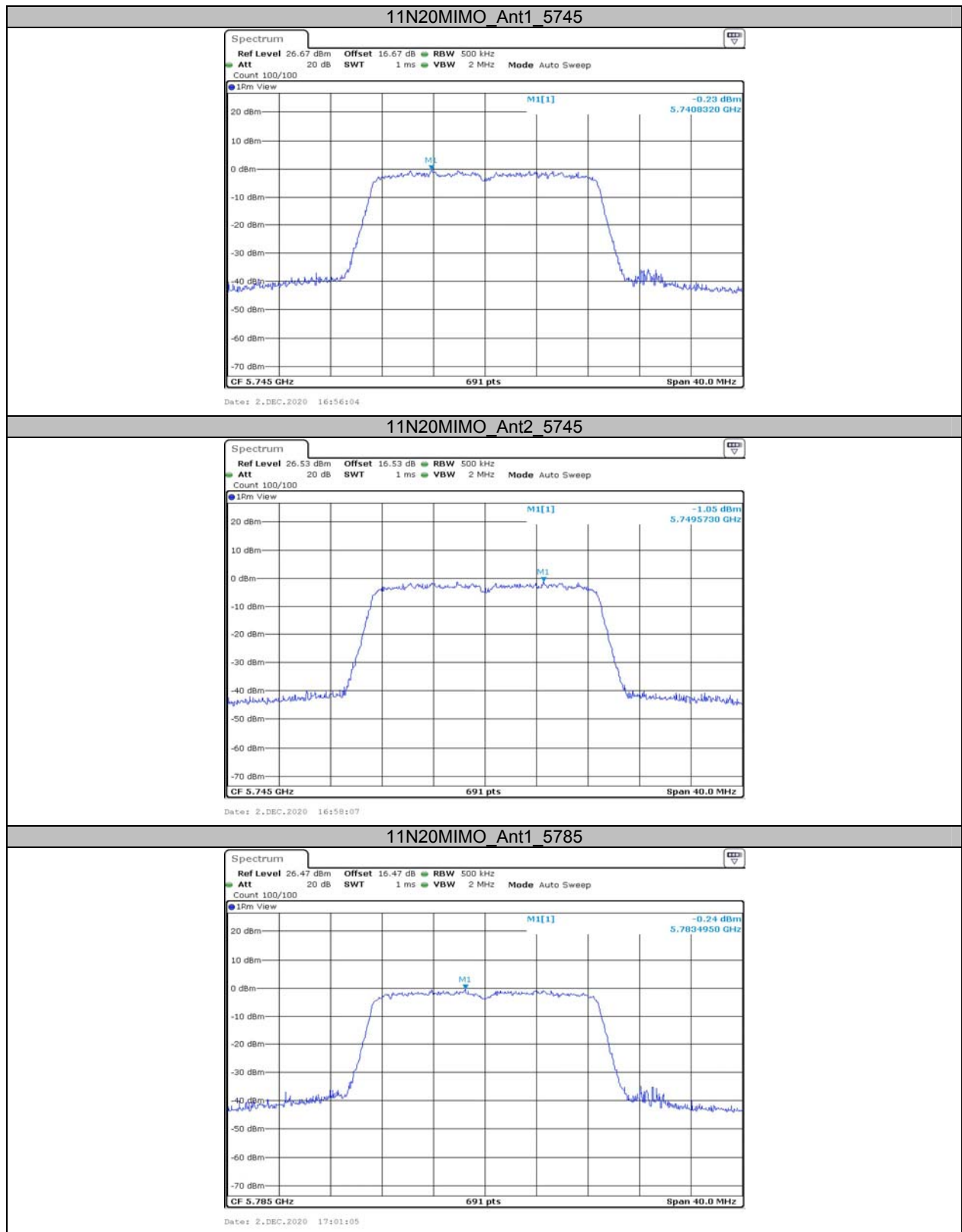


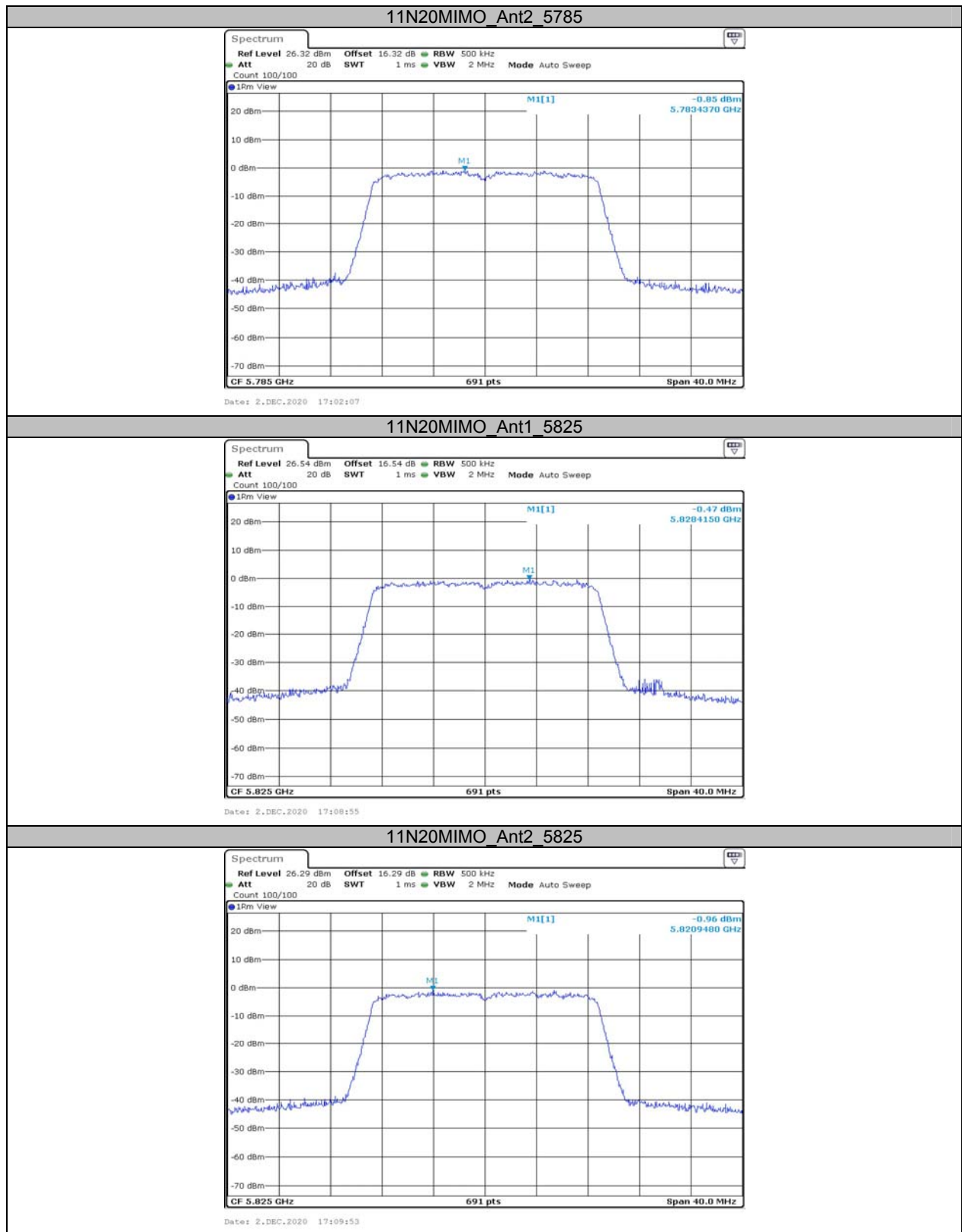
11AMIMO_Ant1_5825

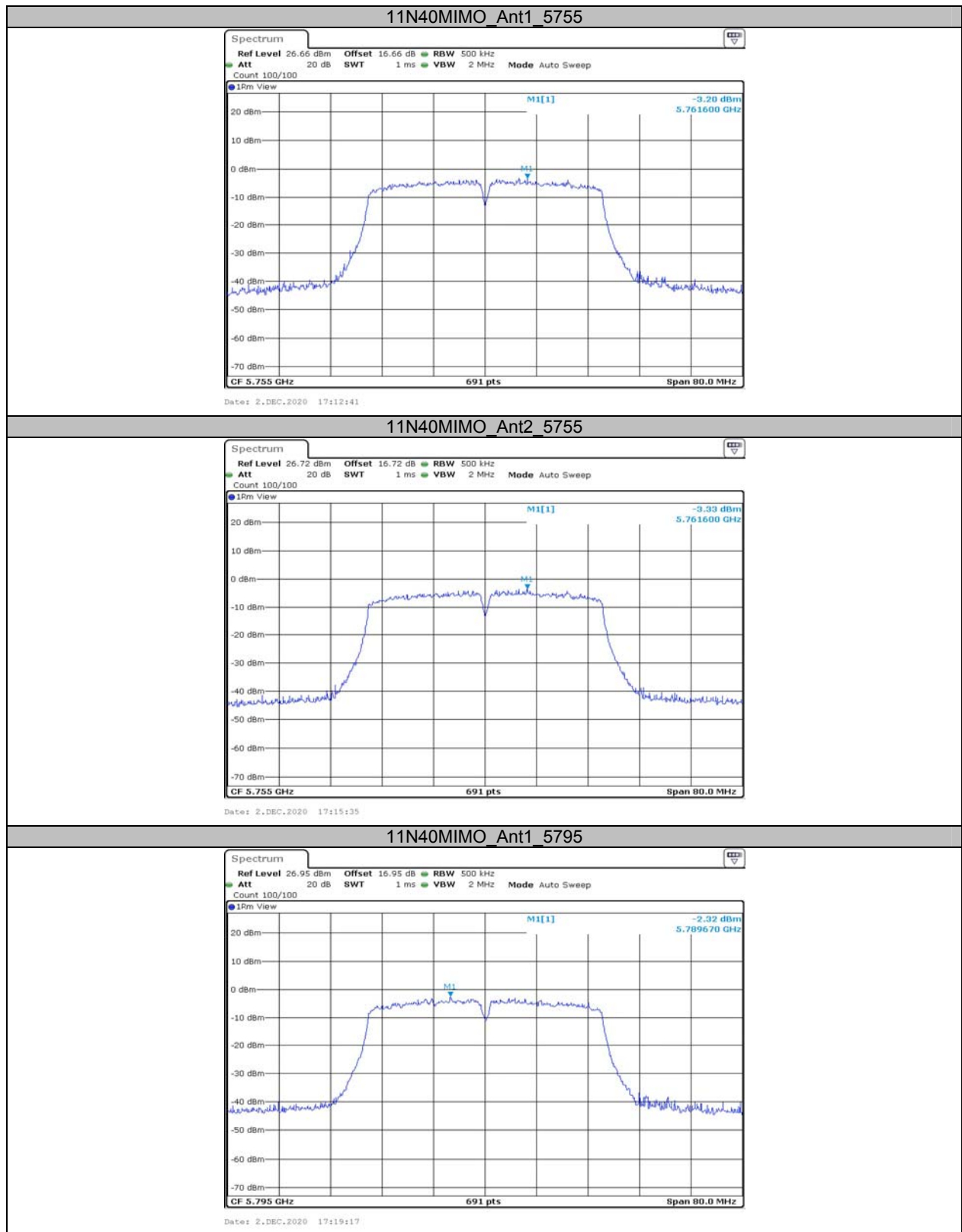


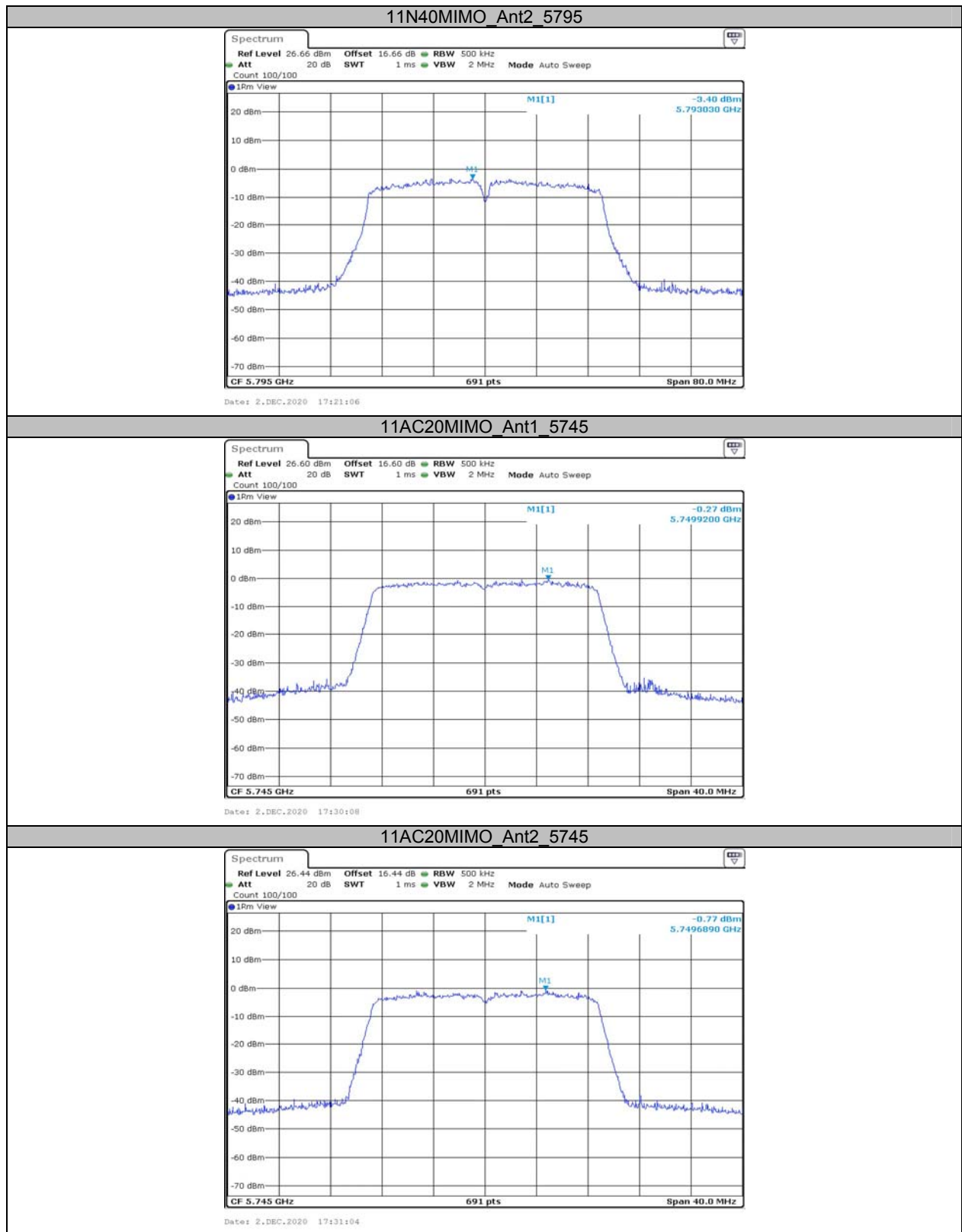
11AMIMO_Ant2_5825







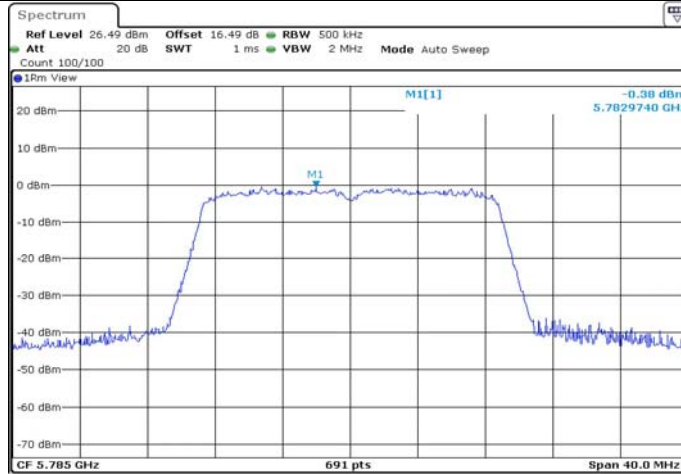




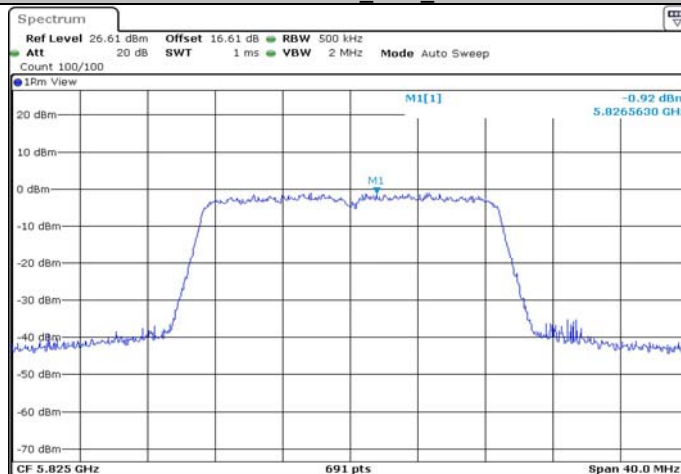
11AC20MIMO Ant1_5785

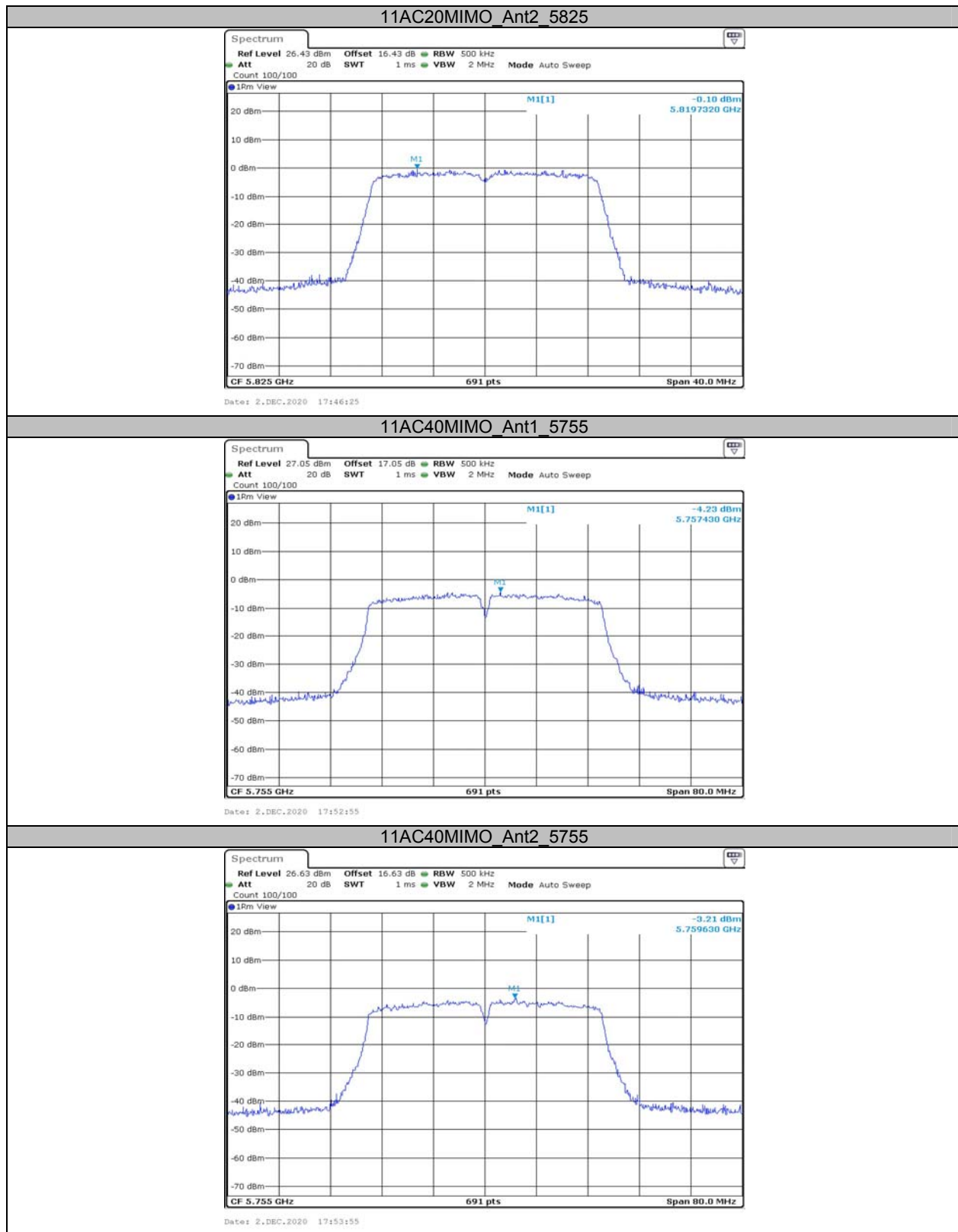


11AC20MIMO Ant2_5785



11AC20MIMO Ant1_5825





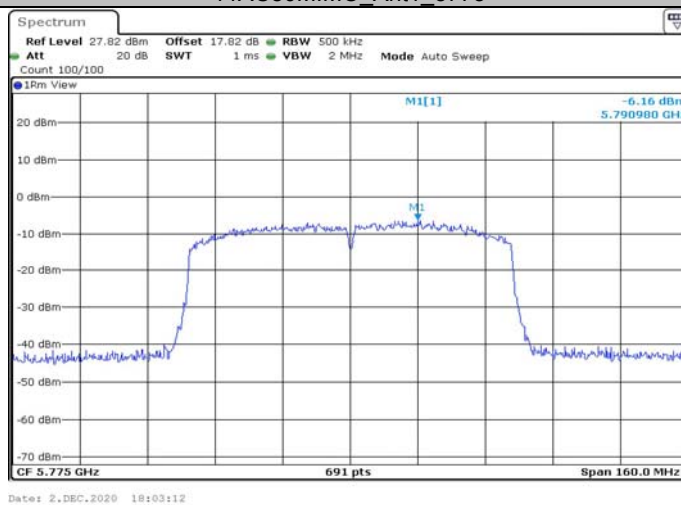
11AC40MIMO Ant1_5795

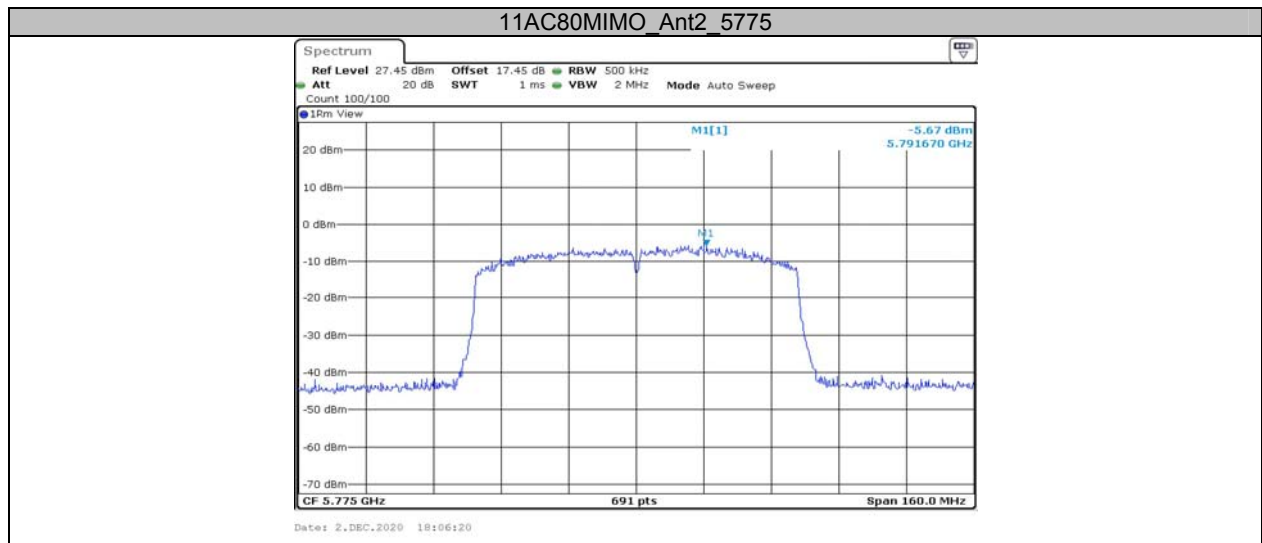


11AC40MIMO Ant2_5795



11AC80MIMO Ant1_5775

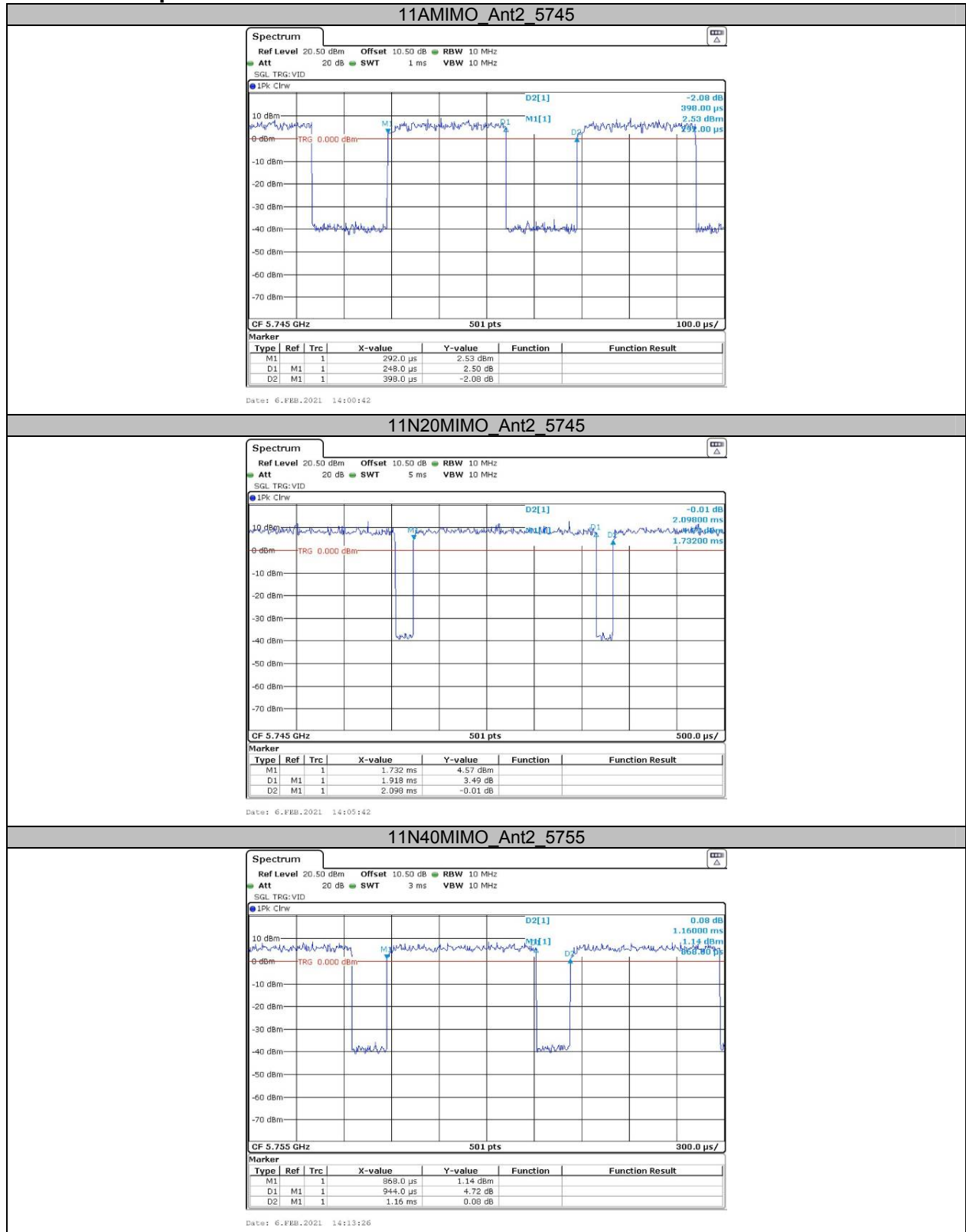




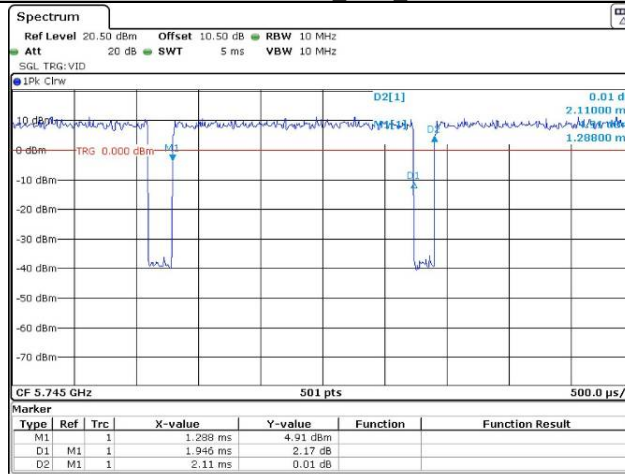
AppendixD: DutyCycle**Test Result**

TestMode	Antenna	Channel	TransmissionDuration [ms]	Transmission Period [ms]	Duty Cycle [%]
11AMIMO	Ant2	5745	0.248	0.398	62.31
11N20MIMO	Ant2	5745	1.918	2.098	91.42
11N40MIMO	Ant2	5755	0.944	1.16	81.38
11AC20MIMO	Ant2	5745	1.946	2.11	92.23
11AC40MIMO	Ant2	5755	0.956	1.19	80.34
11AC80MIMO	Ant2	5775	0.464	0.62	73.23

Test Graphs

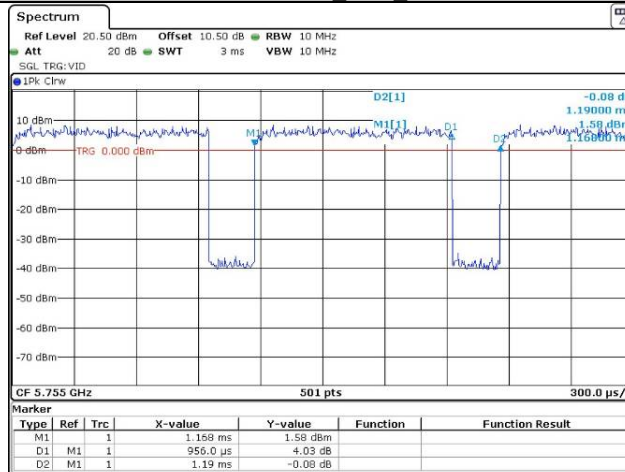


11AC20MIMO_Ant2_5745



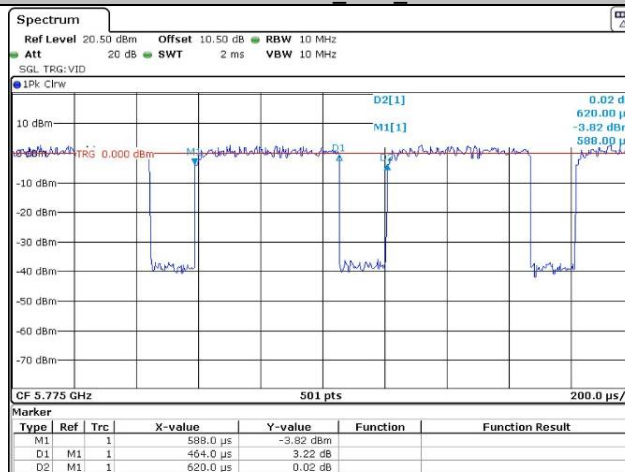
Date: 6.FEB.2021 14:17:10

11AC40MIMO_Ant2_5755



Date: 6.FEB.2021 14:15:23

11AC80MIMO_Ant2_5775



Date: 6.FEB.2021 12:13:18

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