FCC PART 15.407

TEST REPORT

For

Shenzhen Youmi Intelligent Technology Co., Ltd.

406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China

FCC ID: 2ATZ4-ABLE01

Report Type:	**Product Type:**
Original Report	Tablet personal computer

Report Number:	SZ1210901-53956E-RF-00C
Report Date:	2021-11-09
Reviewed By:	Candy Li RF Engineer
Prepared By:	Shenzhen Accurate Technology Co., Ltd. 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396 Http://www.atc-lab.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Tablet personal computer
Tested Model	MT01
Multiple Models	MT02, MT03,MT04
Model Differences	Refer to the DoS letter
Trade Name	UMIDIGI
Frequency Range	5G Wi-Fi: 5150-5250 MHz; 5725-5850 MHz
Maximum Average Conducted Output Power	5150-5250 MHz: 13.77dBm 5725-5850 MHz: 12.82dBm
Modulation Technique	OFDM
Antenna Specification*	LDS antenna: 4.5dBi(provided by the applicant)
Voltage Range	DC 3.8V from battery or DC 5V from adapter
Sample serial number	SZ1210901-53956E-RF-S2 for CE&RE Test SZ1210901-53956E-RF-S1 for RF Conducted test (Assigned by ATC, Shenzhen)
Received date	2021-09-01
Sample/EUT Status	Good condition
Adapter information	Model: HJ-0502000W2-US Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5V, 2A

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 ofProcedures for Compliance Testing ofUnlicensed Wireless Devices. And KDB789033D02 General U-NII Test Procedures New Rules v02r01.

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

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
Emissions, Radiated	30MHz - 1GHz	4.28dB
	1GHz- 18GHz	4.98dB
	18GHz-26.5GHz	5.06dB
	26.5GHz-40GHz	4.72dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

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

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358,the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The EUT 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/ac20 mode: channel 36, 40, 48 were tested;
For 802.11n40/ac40mode: channel 38, 46 were tested.
For 802.11ac80 mode, channel 42 was tested.

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

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

For 802.11a, 802.11n20/ac20 mode: channel 149, 157, 165 were tested;
For 802.11n40/ac40mode: channel 151, 159 were tested.
For 802.11ac80 mode, channel 155 was tested.

EUT Exercise Software

Test in the engineer mode.

Test frequencies and power level were configured as below:

U-NII	Mode	Date rate	Power Level*		
			Low Channel	Middle Channel	High Channel
5150 – 5250MHz	802.11a	6Mbps	Default	Default	Default
	802.11n-HT20	MCS0	Default	Default	Default
	802.11n-HT40	MCS0	Default	/	Default
	802.11ac20	MCS0	Default	Default	Default
	802.11ac40	MCS0	Default	/	Default
	802.11ac80	MCS0	/	Default	/
5725 – 5850MHz	802.11a	6Mbps	Default	Default	Default
	802.11n-HT20	MCS0	Default	Default	Default
	802.11n-HT40	MCS0	Default	/	Default
	802.11ac20	MCS0	Default	Default	Default
	802.11ac40	MCS0	Default	/	Default
	802.11ac80	MCS0	/	Default	/

Note 1: The worse-case data rates are determined to be as follows for each mode based upon investigations by measuring the output power and PSD across all data rated bandwidths, and modulations.
Note 2: 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

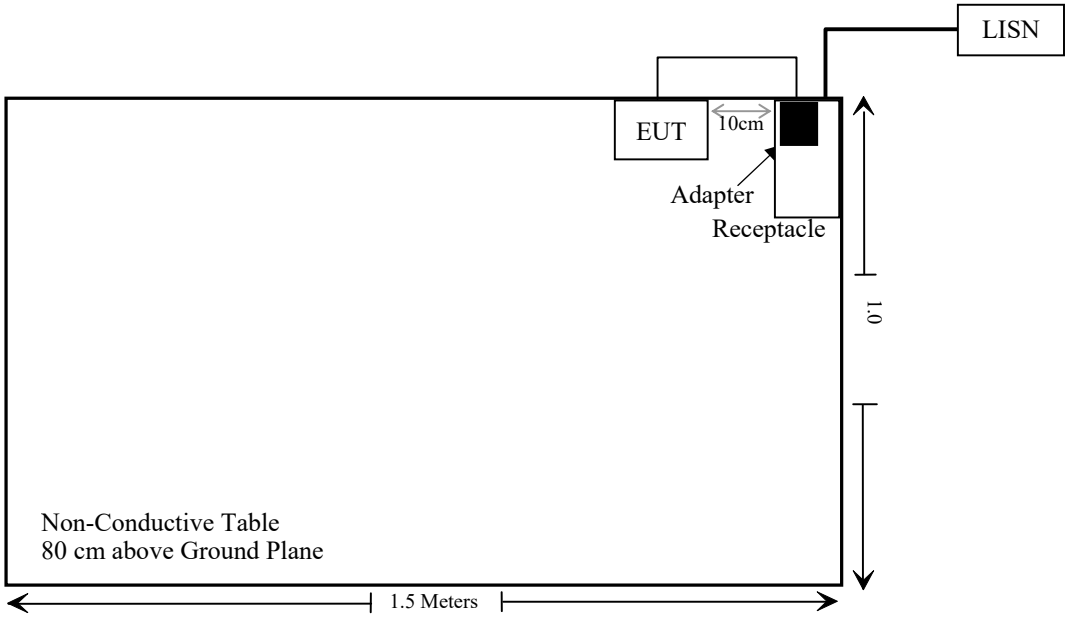
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

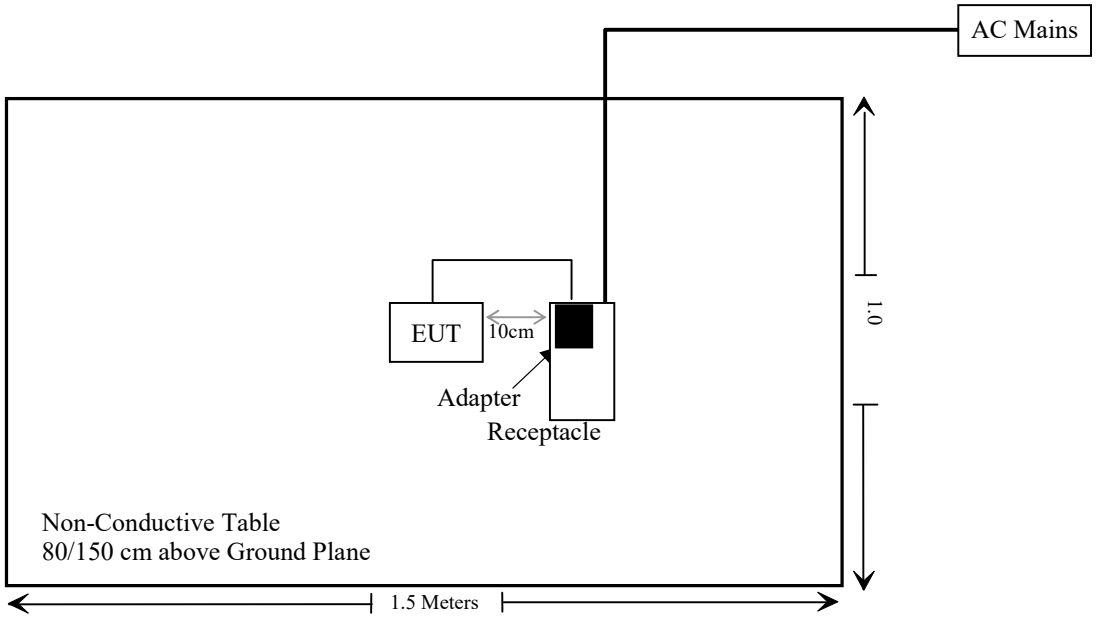
Cable Description	Length(m)	From Port	To
Un-shielding Detachable USB Cable	1.0	EUT	Adapter

Block Diagram of Test Setup

For conducted emission:



For radiated emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 ,§2.1093	RF Exposure(SAR)	Compliant*
§15.203	Antenna Requirement	Compliant
§15.407(b)(8)& §15.207(a)	Conducted Emissions	Compliant
§15.205 & §15.209 &§15.407(b) (1), (4), (8), (9), (10)	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (12), (e)	Bandwidth	Compliant
§15.407(a) (1), (3)	Conducted Transmitter Output Power	Compliant
§15.407 (a)(1),(3)	Power Spectral Density	Compliant
§15.407 (h)	Transmit Power Control (TPC)	Not Applicable
§15.407 (h)	Dynamic Frequency Selection (DFS)	Not Applicable*

Not Applicable: the EUT has no TPC function which was declarded by the applicant.
Not Applicable*: the EUT not operate in frequency range of 5250-5350MHz and 5470-5725MHz.
Compliant*: please refer to SAR report: SZ1210901-53956E-20.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission test					
Rohde& Schwarz	Test Receiver	ESPI3	100396	2020/12/24	2021/12/23
R & S	L.I.S.N.	ENV216	101314	2020/12/25	2021/12/24
Anritsu Corp	50ΩCoaxial Switch	MP59B	6200506474	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-2m	No.2	2020/12/25	2021/12/24
Conducted Emission Test Software: ES-K1 V1.71					
Radiated emission test					
Rohde& Schwarz	Test Receiver	ESR	101817	2020/12/24	2021/12/23
Rohde&Schwarz	Spectrum Analyzer	FSV40	101495	2020/12/24	2021/12/23
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2021/07/08	2022/07/07
Quinstar	Amplifier	QLW-184055 36-J0	15964001002	2020/11/28	2021/11/27
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Unknown	RF Coaxial Cable	N-5m	No.3	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-5m	No.4	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.5	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.6	2020/12/25	2021/12/24
CD	Band Reject Filter	BRM-5.15/5.35g-45	075	2020/12/25	2021/12/24
CD	Band Reject Filter	BRM-5.725/5.875G-45	065	2020/12/25	2021/12/24
Radiated Emission Test Software: EZ_EMC V 1.1.4.2					
Radiated Emission Test Software: e3 19821b(V9)					

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF conducted test					
Rohde&Schwarz	Spectrum Analyzer	FSV40	101495	2020/12/24	2021/12/23
Tonscend	RF Control Unit	JS0806-2	19G8060182	2021/07/06	2022/07/05

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

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

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: SZ1210901-53956E-20.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.
The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT hasone internal antenna, whichwas permanently attached or used a unique connector, and the maximum antenna gain is4.5dBi,fulfill the requirement of this section. Please refer to the EUT photos.

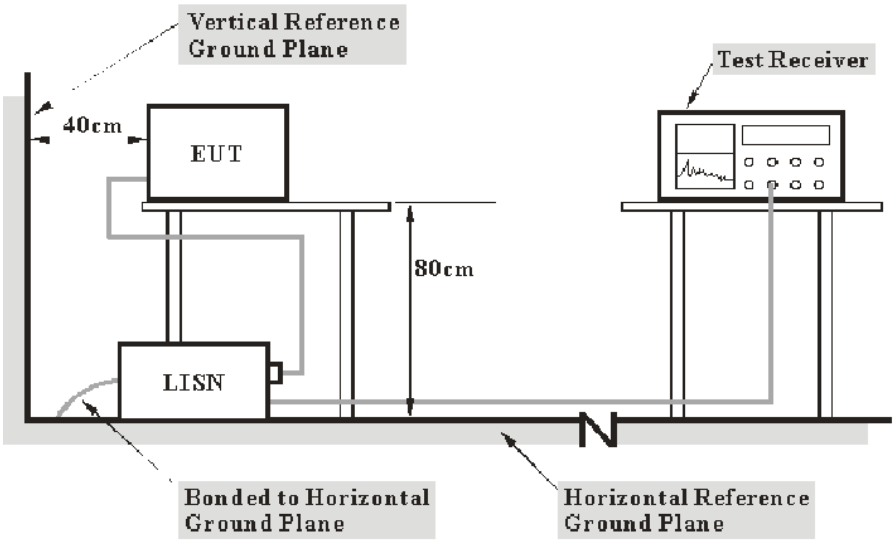
Result: Compliance.

FCC §15.407 (B) (8) §15.207 (A) – CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207, §15.407(b) (8)

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 10cm.

EMI Test Receiver Setup

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

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

FrequencyRange	IF B/W
150 kHz – 30MHz	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.

Transd Factor & Margin Calculation

The Transd factor is calculated by addingLISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Transd Factor = LISN VDF + Cable Loss

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

Margin = Limit – level
Level= reading level+Transd Factor

Test Data

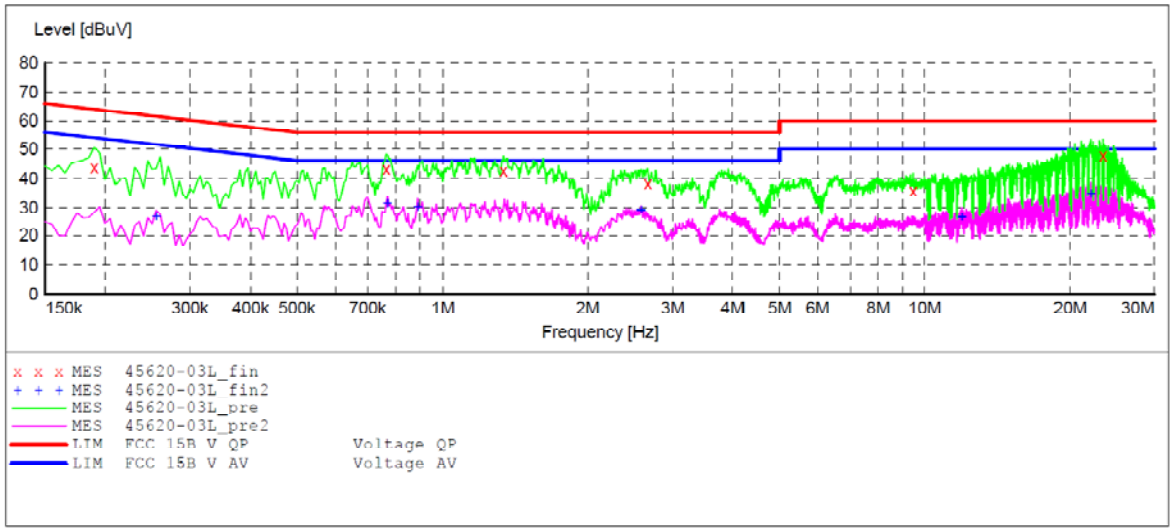
Environmental Conditions

Temperature:	24℃
Relative Humidity:	48%
ATM Pressure:	101.0 kPa

The testing was performed by Black Dingon 2021-09-30.

EUT operation mode: Transmitting (worst case is 802.11n40 mode, 5230MHz)

AC 120V/60 Hz, Line



MEASUREMENT RESULT: "45620-03L_fin"

2021-9-30 10:23

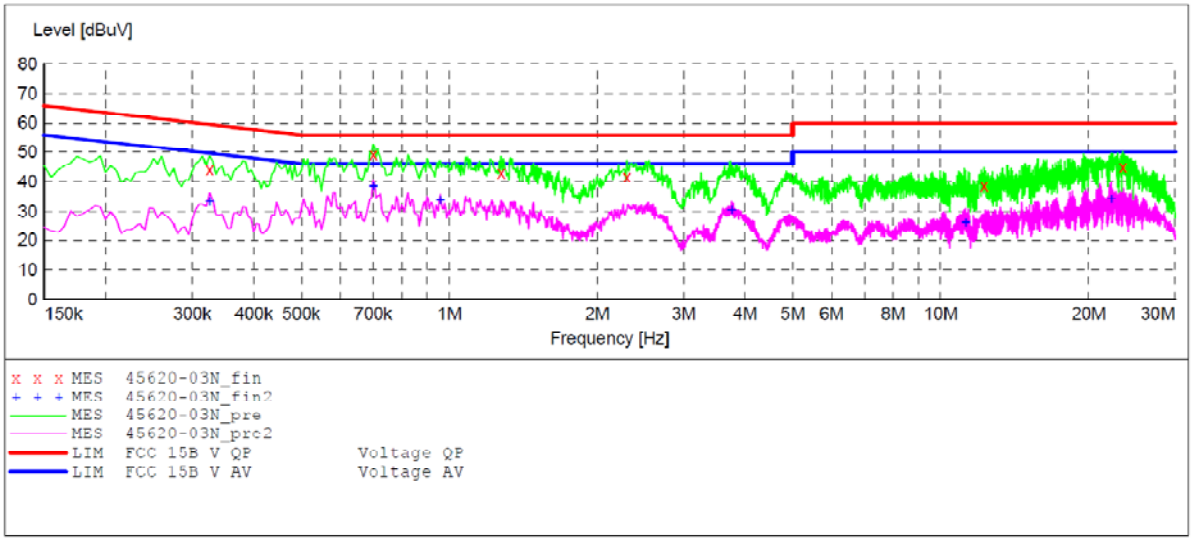
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.190000	44.00	10.8	64	20.0	QP	L1	GND
0.765000	43.30	11.1	56	12.7	QP	L1	GND
1.340000	42.70	11.2	56	13.3	QP	L1	GND
2.660000	38.30	11.3	56	17.7	QP	L1	GND
9.470000	35.70	11.6	60	24.3	QP	L1	GND
23.425000	47.70	11.7	60	12.3	QP	L1	GND

MEASUREMENT RESULT: "45620-03L_fin2"

2021-9-30 10:23

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.255000	26.80	10.9	52	25.2	AV	L1	GND
0.770000	31.40	11.1	46	14.6	AV	L1	GND
0.890000	30.30	11.1	46	15.7	AV	L1	GND
2.580000	29.00	11.3	46	17.0	AV	L1	GND
11.925000	26.60	11.6	50	23.4	AV	L1	GND
22.100000	34.60	11.7	50	15.4	AV	L1	GND

AC 120V/60 Hz, Neutral



MEASUREMENT RESULT: "45620-03N_fin"

2021-9-30 10:21

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.325000	44.20	10.9	60	15.8	QP	N	GND
0.700000	49.20	11.1	56	6.8	QP	N	GND
1.275000	43.00	11.2	56	13.0	QP	N	GND
2.300000	41.80	11.3	56	14.2	QP	N	GND
12.250000	38.50	11.6	60	21.5	QP	N	GND
23.500000	45.00	11.7	60	15.0	QP	N	GND

MEASUREMENT RESULT: "45620-03N_fin2"

2021-9-30 10:20

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.325000	33.30	10.9	50	16.7	AV	N	GND
0.700000	38.20	11.1	46	7.8	AV	N	GND
0.960000	33.80	11.1	46	12.2	AV	N	GND
3.750000	30.60	11.4	46	15.4	AV	N	GND
11.250000	26.00	11.6	50	24.0	AV	N	GND
22.250000	34.00	11.7	50	16.0	AV	N	GND

§15.205& §15.209&§15.407(B) (1),(4), (8) , (9),(10)– UNDESIRABLE EMISSION

Applicable Standard

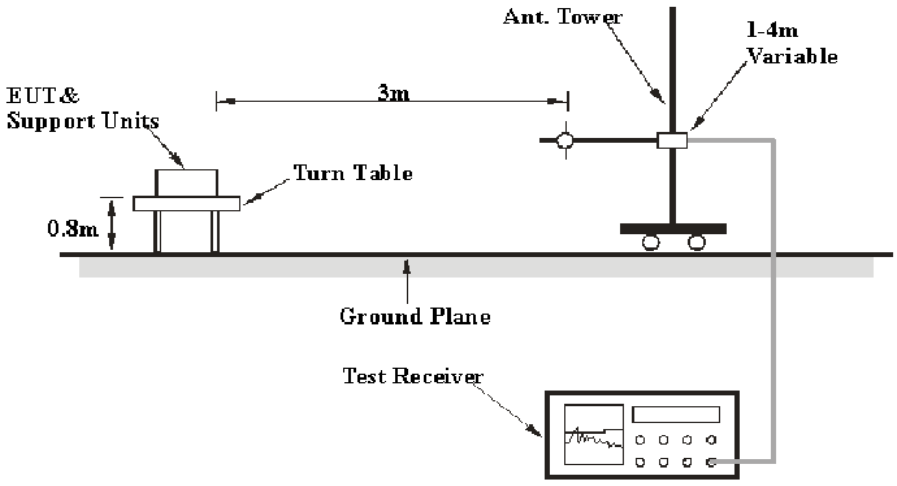
FCC §15.407 (b) (1),(4), (8), (9), (10); §15.209;§15.205;

(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.

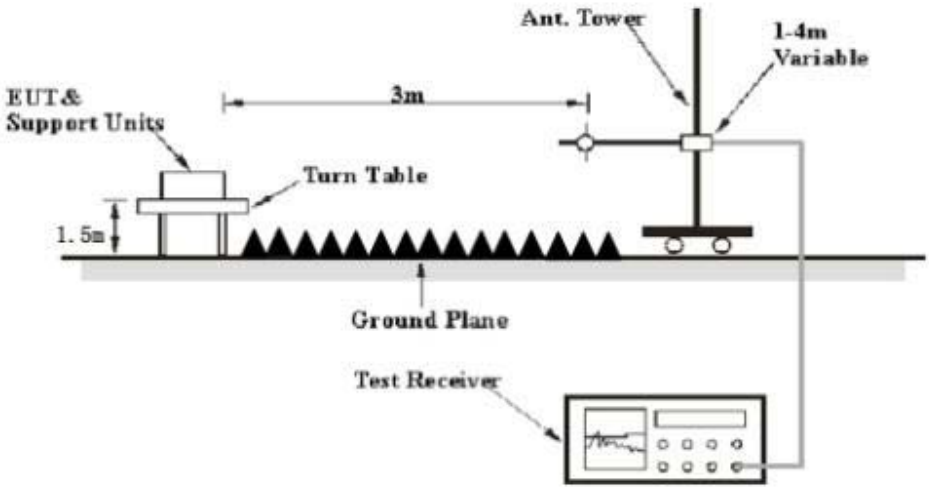
Unwanted emissions below 1 GHzmust comply with the general fieldstrength limits set forth in §15.209.

EUT Setup

Below 1 GHz:



Above 1GHz:



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

EMI Test Receiver&Spectrum Analyzer Setup

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

FrequencyRange	RBW	Video B/W	IF B/W	Measurement
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	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

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

Factor& Margin Calculation

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

Factor = Meter Reading + Antenna Factor + Cable Loss - 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:

Margin = Result-Limit
Result = Reading + Factor

Test Data

Environmental Conditions

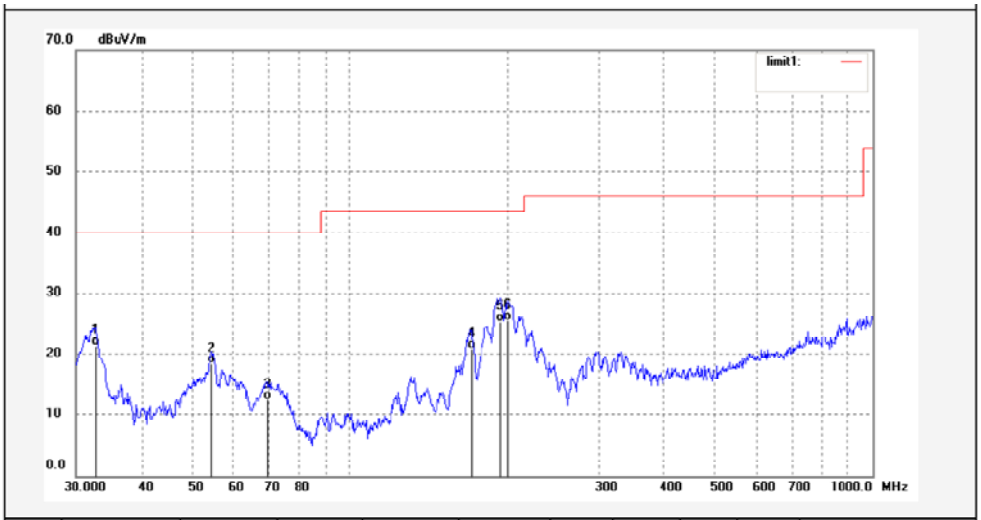
Temperature:	23~28.6℃
Relative Humidity:	48~54 %
ATM Pressure:	100.9~101.0 kPa

The testing was performed by Icey Huang on 2021-10-01 for below 1GHz and Caro Hu on 2021-09-13.

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

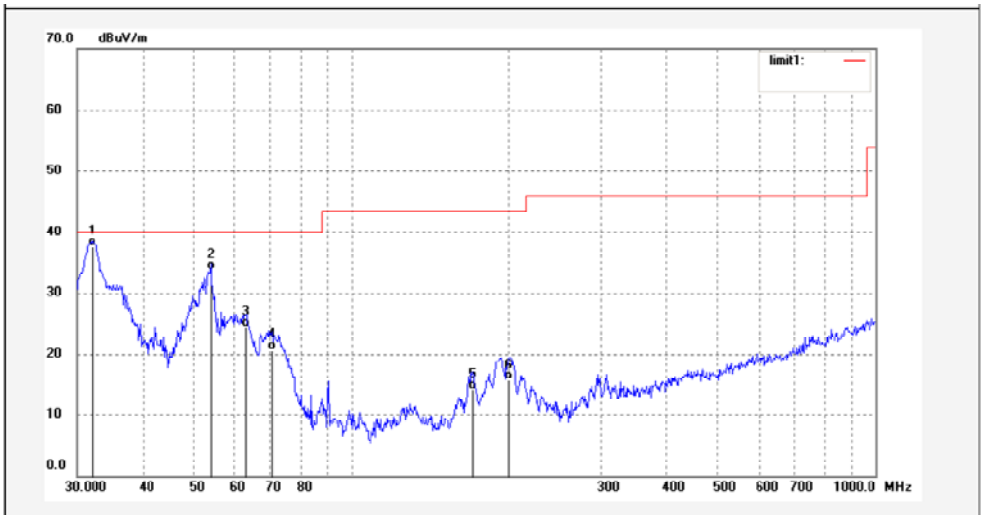
30 MHz~1 GHz:*(worst case is 802.11n40 mode, 5230MHz)*

Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	32.6340	41.39	-20.03	21.36	40.00	-18.64	QP			
2	54.4516	35.88	-17.37	18.51	40.00	-21.49	QP			
3	69.6005	33.49	-20.98	12.51	40.00	-27.49	QP			
4	170.7926	39.68	-18.69	20.99	43.50	-22.51	QP			
5	194.4534	42.86	-17.64	25.22	43.50	-18.28	QP			
6	201.3930	43.07	-17.60	25.47	43.50	-18.03	QP			

Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	32.0667	51.81	-14.17	37.64	40.00	-2.36	QP			
2	54.0711	51.50	-17.61	33.89	40.00	-6.11	QP			
3	62.6507	43.98	-19.65	24.33	40.00	-15.67	QP			
4	70.8315	41.81	-21.02	20.79	40.00	-19.21	QP			
5	170.1948	32.75	-18.69	14.06	43.50	-29.44	QP			
6	198.5880	33.34	-17.64	15.70	43.50	-27.80	QP			

1 ~ 40 GHz:

5150-5250MHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11a									
5180 MHZ									
4500	56.90	PK	17	2.1	H	1.89	58.79	74	-15.21
4500	43.24	Ave.	17	2.1	H	1.89	45.13	54	-8.87
4500	55.00	PK	188	1.7	V	1.89	56.89	74	-17.11
4500	40.85	Ave.	188	1.7	V	1.89	42.74	54	-11.26
5150	56.66	PK	128	1.5	H	3.37	60.03	74	-13.97
5150	42.19	Ave.	128	1.5	H	3.37	45.56	54	-8.44
5150	54.57	PK	149	1.8	V	3.37	57.94	74	-16.06
5150	40.34	Ave.	149	1.8	V	3.37	43.71	54	-10.29
10360	34.63	PK	300	1.8	H	14.41	49.04	68.2	-19.16
10360	32.57	PK	243	1.7	V	14.41	46.98	68.2	-21.22
5200 MHZ									
10400	37.25	PK	316	2.0	H	11.46	48.71	68.2	-19.49
10400	33.80	PK	112	2.1	V	11.46	45.26	68.2	-22.94
5240 MHZ									
5350	54.92	PK	56	2.1	H	3.43	58.35	74	-15.65
5350	41.72	Ave.	56	2.1	H	3.43	45.15	54	-8.85
5350	53.54	PK	9	1.9	V	3.43	56.97	74	-17.03
5350	39.79	Ave.	9	1.9	V	3.43	43.22	54	-10.78
5460	81.35	PK	307	2.0	H	3.58	84.93	74	10.93
5460	42.04	Ave.	307	2.0	H	3.58	45.62	54	-8.38
5460	54.14	PK	269	2.0	V	3.58	57.72	74	-16.28
5460	40.33	Ave.	269	2.0	V	3.58	43.91	54	-10.09
10480	37.13	PK	298	1.6	H	11.53	48.66	68.2	-19.54
10480	34.22	PK	44	2.1	V	11.53	45.75	68.2	-22.45

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11n20									
5180 MHZ									
4500	56.76	PK	258	1.6	H	1.89	58.65	74	-15.35
4500	43.22	Ave.	258	1.6	H	1.89	45.11	54	-8.89
4500	54.51	PK	92	2.0	V	1.89	56.40	74	-17.60
4500	40.86	Ave.	92	2.0	V	1.89	42.75	54	-11.25
5150	56.46	PK	74	1.7	H	3.37	59.83	74	-14.17
5150	42.16	Ave.	74	1.7	H	3.37	45.53	54	-8.47
5150	54.50	PK	271	1.9	V	3.37	57.87	74	-16.13
5150	40.29	Ave.	271	1.9	V	3.37	43.66	54	-10.34
10360	34.84	PK	191	2.1	H	14.41	49.25	68.2	-18.95
10360	31.61	PK	211	1.6	V	14.41	46.02	68.2	-22.18
5200 MHZ									
10400	37.64	PK	278	1.7	H	11.46	49.10	68.2	-19.10
10400	35.12	PK	301	1.6	V	11.46	46.58	68.2	-21.62
5240 MHZ									
5350	55.33	PK	314	1.8	H	3.43	58.76	74	-15.24
5350	41.51	Ave.	314	1.8	H	3.43	44.94	54	-9.06
5350	53.18	PK	98	1.6	V	3.43	56.61	74	-17.39
5350	39.37	Ave.	98	1.6	V	3.43	42.80	54	-11.20
5460	55.65	PK	133	1.7	H	3.58	59.23	74	-14.77
5460	42.13	Ave.	133	1.7	H	3.58	45.71	54	-8.29
5460	54.01	PK	8	1.8	V	3.58	57.59	74	-16.41
5460	40.30	Ave.	8	1.8	V	3.58	43.88	54	-10.12
10480	36.84	PK	251	1.8	H	11.53	48.37	68.2	-19.83
10480	34.03	PK	347	2.0	V	11.53	45.56	68.2	-22.64

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11N40									
5190 MHZ									
4500	61.20	PK	167	1.6	H	1.89	63.09	74	-10.91
4500	43.64	Ave.	167	1.6	H	1.89	45.53	54	-8.47
4500	59.04	PK	277	2.1	V	1.89	60.93	74	-13.07
4500	41.72	Ave.	277	2.1	V	1.89	43.61	54	-10.39
5150	56.05	PK	226	1.9	H	3.37	59.42	74	-14.58
5150	42.67	Ave.	226	1.9	H	3.37	46.04	54	-7.96
5150	54.21	PK	330	1.6	V	3.37	57.58	74	-16.42
5150	40.62	Ave.	330	1.6	V	3.37	43.99	54	-10.01
10380	37.49	PK	228	1.6	H	11.43	48.92	68.2	-19.28
10380	34.23	PK	229	1.6	V	11.43	45.66	68.2	-22.54
5230 MHZ									
5350	55.56	PK	288	1.6	H	3.43	58.99	74	-15.01
5350	42.26	Ave.	288	1.6	H	3.43	45.69	54	-8.31
5350	53.55	PK	167	1.9	V	3.43	56.98	74	-17.02
5350	40.34	Ave.	167	1.9	V	3.43	43.77	54	-10.23
5460	55.80	PK	232	1.5	H	3.58	59.38	74	-14.62
5460	42.81	Ave.	232	1.5	H	3.58	46.39	54	-7.61
5460	54.02	PK	16	1.6	V	3.58	57.60	74	-16.40
5460	40.49	Ave.	16	1.6	V	3.58	44.07	54	-9.93
10460	36.57	PK	15	1.9	H	11.5	48.07	68.2	-20.13
10460	34.20	PK	11	1.7	V	11.5	45.70	68.2	-22.50

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AC20									
5180 MHZ									
4500	57.07	PK	230	1.9	H	1.89	58.96	74	-15.04
4500	42.89	Ave.	230	1.9	H	1.89	44.78	54	-9.22
4500	54.93	PK	87	2.0	V	1.89	56.82	74	-17.18
4500	41.05	Ave.	87	2.0	V	1.89	42.94	54	-11.06
5150	55.75	PK	265	2.1	H	3.37	59.12	74	-14.88
5150	42.28	Ave.	265	2.1	H	3.37	45.65	54	-8.35
5150	53.02	PK	98	1.6	V	3.37	56.39	74	-17.61
5150	40.22	Ave.	98	1.6	V	3.37	43.59	54	-10.41
10360	34.84	PK	50	2.0	H	14.41	49.25	68.2	-18.95
10360	31.41	PK	154	1.7	V	14.41	45.82	68.2	-22.38
5200 MHZ									
10400	38.55	PK	282	2.0	H	11.46	50.01	68.2	-18.19
10400	35.56	PK	242	1.8	V	11.46	47.02	68.2	-21.18
5240 MHZ									
5350	55.21	PK	247	1.6	H	3.43	58.64	74	-15.36
5350	41.42	Ave.	247	1.6	H	3.43	44.85	54	-9.15
5350	52.95	PK	346	1.5	V	3.43	56.38	74	-17.62
5350	39.33	Ave.	346	1.5	V	3.43	42.76	54	-11.24
5460	55.95	PK	193	1.6	H	3.58	59.53	74	-14.47
5460	42.17	Ave.	193	1.6	H	3.58	45.75	54	-8.25
5460	52.85	PK	360	1.7	V	3.58	56.43	74	-17.57
5460	39.94	Ave.	360	1.7	V	3.58	43.52	54	-10.48
10480	37.72	PK	35	1.7	H	11.53	49.25	68.2	-18.95
10480	34.68	PK	174	1.9	V	11.53	46.21	68.2	-21.99

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AC40									
5190 MHZ									
4500	61.19	PK	311	1.8	H	1.89	63.08	74	-10.92
4500	43.64	Ave.	311	1.8	H	1.89	45.53	54	-8.47
4500	58.83	PK	209	2.1	V	1.89	60.72	74	-13.28
4500	42.16	Ave.	209	2.1	V	1.89	44.05	54	-9.95
5150	55.95	PK	222	2.0	H	3.37	59.32	74	-14.68
5150	42.52	Ave.	222	2.0	H	3.37	45.89	54	-8.11
5150	54.03	PK	352	1.9	V	3.37	57.40	74	-16.60
5150	40.91	Ave.	352	1.9	V	3.37	44.28	54	-9.72
10380	36.82	PK	60	1.7	H	11.43	48.25	68.2	-19.95
10380	34.67	PK	261	1.6	V	11.43	46.10	68.2	-22.10
5230 MHZ									
5350	55.13	PK	164	1.7	H	3.43	58.56	74	-15.44
5350	41.65	Ave.	164	1.7	H	3.43	45.08	54	-8.92
5350	53.17	PK	303	1.7	V	3.43	56.60	74	-17.40
5350	40.20	Ave.	303	1.7	V	3.43	43.63	54	-10.37
5460	55.39	PK	222	2.1	H	3.58	58.97	74	-15.03
5460	42.62	Ave.	222	2.1	H	3.58	46.20	54	-7.80
5460	53.27	PK	226	1.9	V	3.58	56.85	74	-17.15
5460	40.43	Ave.	226	1.9	V	3.58	44.01	54	-9.99
10460	36.23	PK	177	1.8	H	11.5	47.73	68.2	-20.47
10460	33.37	PK	72	2.1	V	11.5	44.87	68.2	-23.33

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AC80									
5210MHZ									
4500	56.80	PK	28	2.0	H	1.89	58.69	74	-15.31
4500	43.98	Ave.	28	2.0	H	1.89	45.87	54	-8.13
4500	54.57	PK	27	2.1	V	1.89	56.46	74	-17.54
4500	42.17	Ave.	27	2.1	V	1.89	44.06	54	-9.94
5150	55.61	PK	125	1.7	H	3.37	58.98	74	-15.02
5150	42.92	Ave.	125	1.7	H	3.37	46.29	54	-7.71
5150	53.88	PK	176	1.6	V	3.37	57.25	74	-16.75
5150	41.13	Ave.	176	1.6	V	3.37	44.50	54	-9.50
5350	56.01	PK	84	1.6	H	3.43	59.44	74	-14.56
5350	43.74	Ave.	84	1.6	H	3.43	47.17	54	-6.83
5350	53.92	PK	53	1.8	V	3.43	57.35	74	-16.65
5350	41.57	Ave.	53	1.8	V	3.43	45.00	54	-9.00
5460	55.57	PK	75	2.0	H	3.58	59.15	74	-14.85
5460	42.22	Ave.	75	2.0	H	3.58	45.80	54	-8.20
5460	53.20	PK	75	2.0	V	3.58	56.78	74	-17.22
5460	40.21	Ave.	75	2.0	V	3.58	43.79	54	-10.21
10420	36.62	PK	41	2.0	H	11.49	48.11	68.2	-20.09
10420	34.45	PK	200	1.9	V	11.49	45.94	68.2	-22.26

5725-5850MHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11a									
5745 MHz									
5725	64.6	PK	331	1.7	H	3.97	68.57	122.2	-53.63
5725	63.02	PK	272	1.5	V	3.97	66.99	122.2	-55.21
5720	60.05	PK	63	2.1	H	3.95	64.00	110.8	-46.8
5720	58.6	PK	261	1.8	V	3.95	62.55	110.8	-48.25
5700	59.32	PK	323	1.6	H	3.89	63.21	105.2	-41.99
5700	58.06	PK	125	1.8	V	3.89	61.95	105.2	-43.25
5650	56.66	PK	147	2.0	H	3.75	60.41	68.2	-7.79
5650	55.25	PK	75	2.0	V	3.75	59.00	68.2	-9.2
11490	37.74	PK	78	1.7	H	14.74	52.48	74	-21.52
11490	35.63	PK	272	2.0	V	14.74	50.37	74	-23.63
5785 MHz									
11570	37.6	PK	13	1.5	H	14.74	52.34	74	-21.66
11570	35.24	PK	357	1.9	V	14.74	49.98	74	-24.02
5825 MHz									
5850	63.8	PK	149	2.1	H	4.33	68.13	122.2	-54.07
5850	62.18	PK	78	1.8	V	4.33	66.51	122.2	-55.69
5855	60.98	PK	37	1.6	H	4.35	65.33	110.8	-45.47
5855	59.43	PK	227	1.7	V	4.35	63.78	110.8	-47.02
5875	58.86	PK	207	1.8	H	4.41	63.27	105.2	-41.93
5875	57.27	PK	86	1.8	V	4.41	61.68	105.2	-43.52
5925	55.93	PK	69	1.6	H	4.55	60.48	68.2	-7.72
5925	54.42	PK	288	1.7	V	4.55	58.97	68.2	-9.23
11650	38.66	PK	80	1.6	H	14.79	53.45	74	-20.55
11650	36.35	PK	208	1.5	V	14.79	51.14	74	-22.86

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11n20									
5745 MHz									
5725	64.53	PK	133	2.0	H	3.97	68.50	122.2	-53.7
5725	62.98	PK	261	1.9	V	3.97	66.95	122.2	-55.25
5720	60.96	PK	282	1.7	H	3.95	64.91	110.8	-45.89
5720	59.27	PK	157	2.0	V	3.95	63.22	110.8	-47.58
5700	60.75	PK	179	1.6	H	3.89	64.64	105.2	-40.56
5700	59.26	PK	104	1.9	V	3.89	63.15	105.2	-42.05
5650	57.1	PK	139	1.9	H	3.75	60.85	68.2	-7.35
5650	55.46	PK	92	1.6	V	3.75	59.21	68.2	-8.99
11490	37.27	PK	209	1.7	H	14.74	52.01	74	-21.99
11490	35.01	PK	313	1.8	V	14.74	49.75	74	-24.25
5785 MHz									
11570	37.64	PK	270	1.8	H	14.74	52.38	74	-21.62
11570	35.41	PK	124	1.9	V	14.74	50.15	74	-23.85
5825 MHz									
5850	63.62	PK	314	2.0	H	4.33	67.95	122.2	-54.25
5850	62.01	PK	212	1.7	V	4.33	66.34	122.2	-55.86
5855	60.22	PK	95	2.0	H	4.35	64.57	110.8	-46.23
5855	58.76	PK	27	1.8	V	4.35	63.11	110.8	-47.69
5875	60.24	PK	115	1.7	H	4.41	64.65	105.2	-40.55
5875	58.74	PK	174	1.9	V	4.41	63.15	105.2	-42.05
5925	56.39	PK	263	1.9	H	4.55	60.94	68.2	-7.26
5925	54.96	PK	189	1.9	V	4.55	59.51	68.2	-8.69
11650	39.12	PK	166	1.7	H	14.79	53.91	74	-20.09
11650	36.63	PK	181	1.8	V	14.79	51.42	74	-22.58

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11N40									
5755 MHz									
5725	64.77	PK	141	1.7	H	3.97	68.74	122.2	-53.46
5725	63.37	PK	289	2.1	V	3.97	67.34	122.2	-54.86
5720	60.85	PK	64	1.9	H	3.95	64.80	110.8	-46
5720	59.49	PK	321	1.6	V	3.95	63.44	110.8	-47.36
5700	60.86	PK	140	1.6	H	3.89	64.75	105.2	-40.45
5700	59.32	PK	57	2.0	V	3.89	63.21	105.2	-41.99
5650	57.2	PK	100	1.7	H	3.75	60.95	68.2	-7.25
5650	55.9	PK	35	1.8	V	3.75	59.65	68.2	-8.55
11510	37.37	PK	240	1.8	H	14.74	52.11	74	-21.89
11510	35.24	PK	127	1.5	V	14.74	49.98	74	-24.02
5795 MHz									
5850	64.91	PK	323	1.8	H	4.33	69.24	122.2	-52.96
5850	63.48	PK	17	2.1	V	4.33	67.81	122.2	-54.39
5855	60.56	PK	323	1.5	H	4.35	64.91	110.8	-45.89
5855	58.88	PK	352	1.8	V	4.35	63.23	110.8	-47.57
5875	60.02	PK	242	1.8	H	4.41	64.43	105.2	-40.77
5875	58.77	PK	135	1.6	V	4.41	63.18	105.2	-42.02
5925	55.9	PK	136	1.6	H	4.55	60.45	68.2	-7.75
5925	54.62	PK	178	2.0	V	4.55	59.17	68.2	-9.03
11590	37.55	PK	249	1.8	H	14.74	52.29	74	-21.71
11590	35.41	PK	209	1.9	V	14.74	50.15	74	-23.85

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AC20									
5745 MHz									
5725	64.38	PK	277	1.9	H	3.97	68.35	122.2	-53.85
5725	62.92	PK	63	2.0	V	3.97	66.89	122.2	-55.31
5720	60.64	PK	282	1.9	H	3.95	64.59	110.8	-46.21
5720	59.16	PK	281	1.6	V	3.95	63.11	110.8	-47.69
5700	59.77	PK	137	2.0	H	3.89	63.66	105.2	-41.54
5700	58.29	PK	323	2.0	V	3.89	62.18	105.2	-43.02
5650	56.94	PK	278	1.9	H	3.75	60.69	68.2	-7.51
5650	55.46	PK	350	2.0	V	3.75	59.21	68.2	-8.99
11490	36.74	PK	285	1.6	H	14.74	51.48	74	-22.52
11490	34.63	PK	218	1.7	V	14.74	49.37	74	-24.63
5785 MHz									
11570	37.02	PK	319	1.9	H	14.74	51.76	74	-22.24
11570	34.9	PK	38	2.1	V	14.74	49.64	74	-24.36
5825 MHz									
5850	65.2	PK	250	1.7	H	4.33	69.53	122.2	-52.67
5850	63.61	PK	48	2.1	V	4.33	67.94	122.2	-54.26
5855	61.46	PK	205	1.8	H	4.35	65.81	110.8	-44.99
5855	60.2	PK	173	1.9	V	4.35	64.55	110.8	-46.25
5875	60.3	PK	60	1.7	H	4.41	64.71	105.2	-40.49
5875	58.81	PK	349	1.9	V	4.41	63.22	105.2	-41.98
5925	73.57	PK	4	1.9	H	4.55	78.12	68.2	9.92
5925	72.12	PK	18	1.9	V	4.55	76.67	68.2	8.47
11650	38.41	PK	318	1.7	H	14.79	53.20	74	-20.8
11650	35.94	PK	154	1.8	V	14.79	50.73	74	-23.27

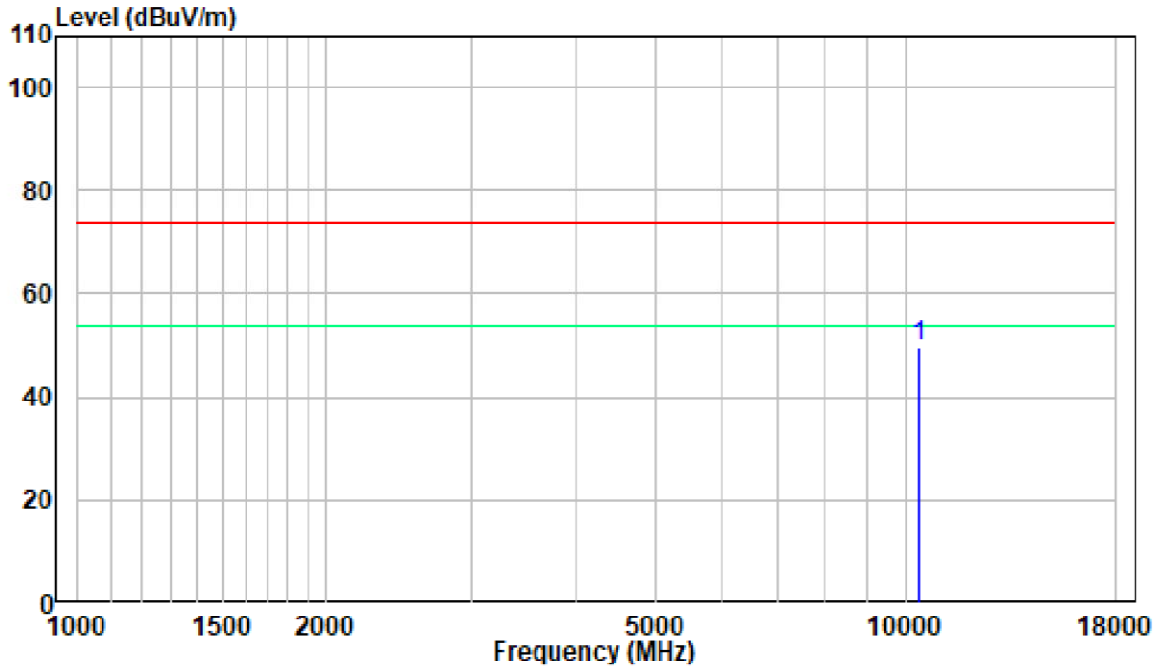
Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11AC40 MIMO									
5755MHz									
5725	65.12	PK	278	1.5	H	3.97	69.09	122.2	-53.11
5725	63.56	PK	169	1.6	V	3.97	67.53	122.2	-54.67
5720	59.9	PK	45	1.8	H	3.95	63.85	110.8	-46.95
5720	58.61	PK	260	1.5	V	3.95	62.56	110.8	-48.24
5700	59.62	PK	188	1.8	H	3.89	63.51	105.2	-41.69
5700	58.26	PK	230	1.6	V	3.89	62.15	105.2	-43.05
5650	56.48	PK	208	1.7	H	3.75	60.23	68.2	-7.97
5650	55.2	PK	329	2.0	V	3.75	58.95	68.2	-9.25
11510	36.51	PK	104	1.7	H	14.74	51.25	74	-22.75
11510	34.12	PK	345	1.9	V	14.74	48.86	74	-25.14
5795 MHz									
5850	64.02	PK	195	2.0	H	4.33	68.35	122.2	-53.85
5850	62.77	PK	193	1.8	V	4.33	67.10	122.2	-55.1
5855	50.13	PK	78	2.0	H	4.35	54.48	110.8	-56.32
5855	48.54	PK	246	1.9	V	4.35	52.89	110.8	-57.91
5875	58.85	PK	29	2.0	H	4.41	63.26	105.2	-41.94
5875	57.28	PK	94	1.6	V	4.41	61.69	105.2	-43.51
5925	56.21	PK	117	1.7	H	4.55	60.76	68.2	-7.44
5925	54.96	PK	334	1.7	V	4.55	59.51	68.2	-8.69
11590	37.69	PK	326	1.9	H	14.74	52.43	74	-21.57
11590	35.27	PK	24	2.0	V	14.74	50.01	74	-23.99

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave.		Height (m)	Polar (H/V)				
802.11AC80 MIMO									
5775MHz									
5725	63.51	PK	337	1.9	H	3.97	67.48	122.2	-54.72
5725	62.22	PK	206	2.0	V	3.97	66.19	122.2	-56.01
5720	59.57	PK	33	1.7	H	3.95	63.52	110.8	-47.28
5720	58.2	PK	299	2.0	V	3.95	62.15	110.8	-48.65
5700	146.22	PK	132	1.9	H	3.89	150.11	105.2	44.91
5700	144.83	PK	334	2.0	V	3.89	148.72	105.2	43.52
5650	56.81	PK	8	1.7	H	3.75	60.56	68.2	-7.64
5650	55.2	PK	265	1.8	V	3.75	58.95	68.2	-9.25
5850	64.3	PK	307	2.1	H	4.33	68.63	122.2	-53.57
5850	62.88	PK	127	1.6	V	4.33	67.21	122.2	-54.99
5855	60.11	PK	63	1.7	H	4.35	64.46	110.8	-46.34
5855	58.76	PK	7	1.7	V	4.35	63.11	110.8	-47.69
5875	59.25	PK	123	1.7	H	4.41	63.66	105.2	-41.54
5875	57.94	PK	106	1.7	V	4.41	62.35	105.2	-42.85
5925	56.2	PK	319	2.0	H	4.55	60.75	68.2	-7.45
5925	54.98	PK	222	1.7	V	4.55	59.53	68.2	-8.67
11550	35.43	PK	301	1.9	H	14.74	50.17	74	-23.83
11550	32.9	PK	52	1.7	V	14.74	47.64	74	-26.36

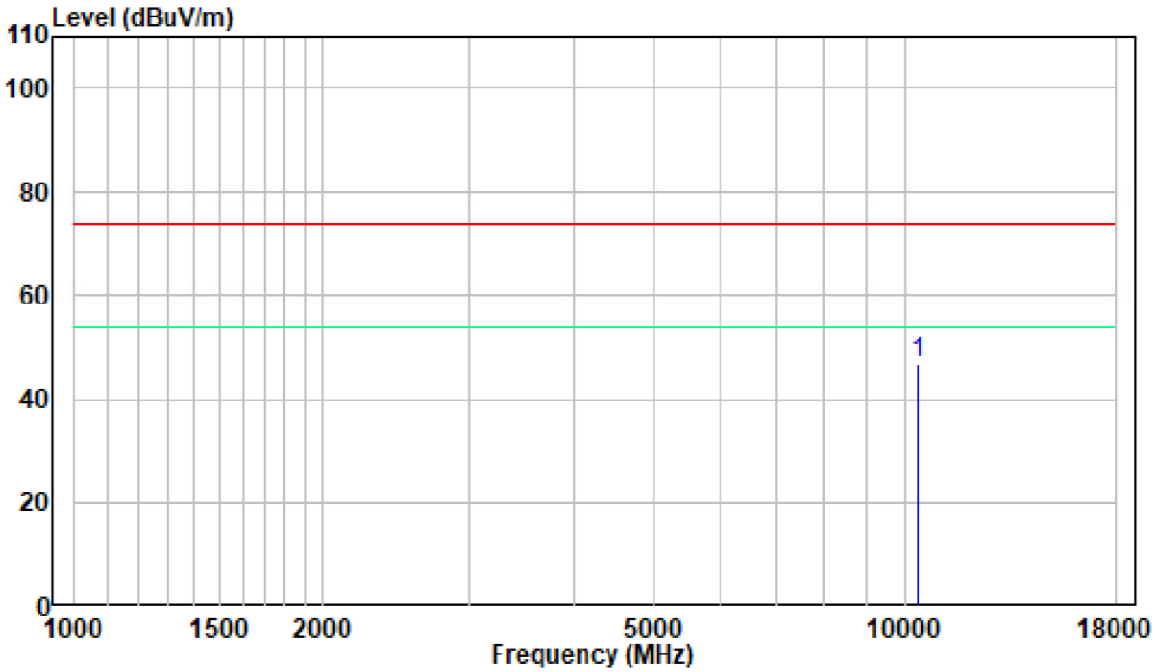
Note:
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is in the noise floor level was not recorded.
The test result of peak was less than the limit of average, so just peak values were recorded.

1-18 GHz:

Pre-scan for Peak
802.11n20 5180MHz
Horizontal:

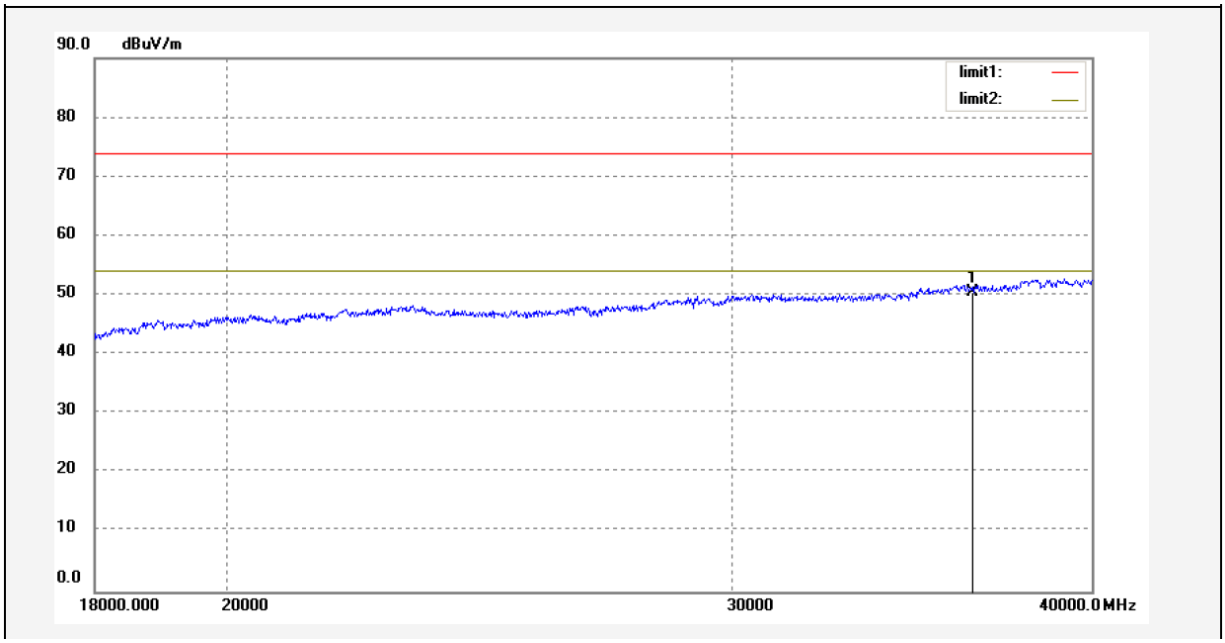


Vertical:

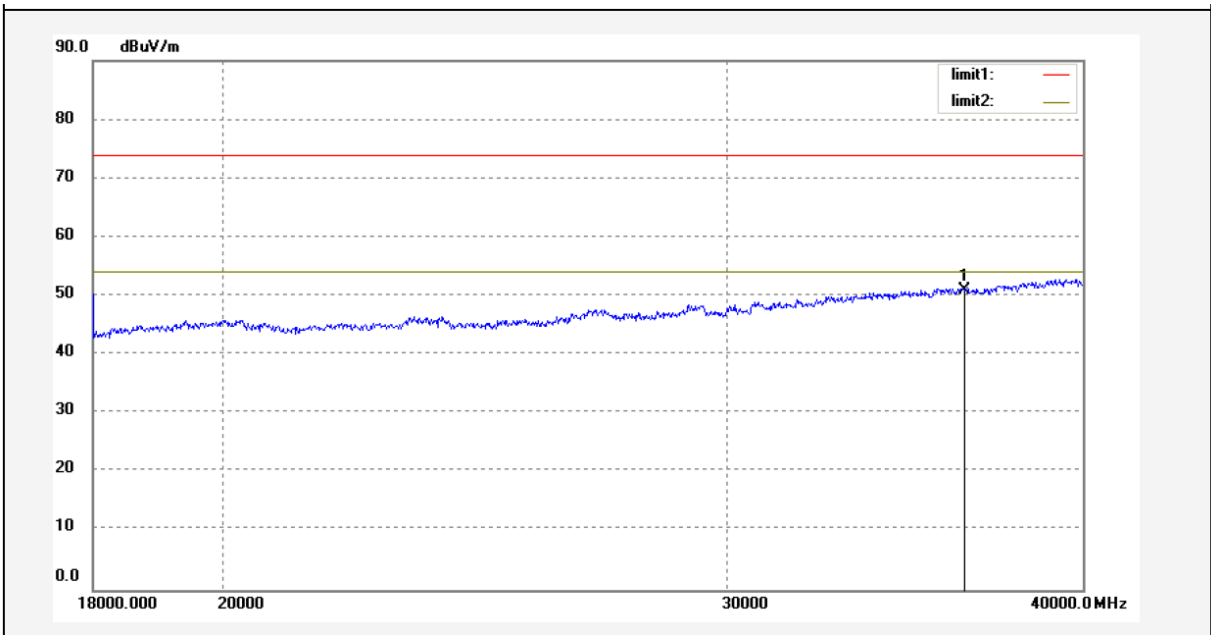


18-40 GHz:

Pre-scan for Peak
802.11n20 5180MHz
Horizontal:



Vertical:



FCC §15.407(a)(e) –BANDWIDTH

Applicable Standard

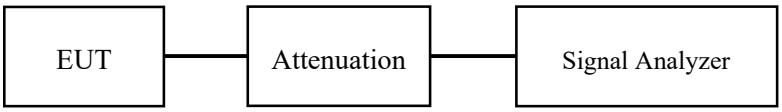
The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band 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) ≥ 3 × 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 ℃
Relative Humidity:	57%
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2021-09-15.

EUT operation mode: Transmitting

Test Result:Pass

Please refer to the Appendix

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

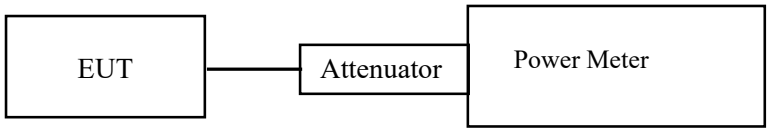
Applicable Standard

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:	27 ℃
Relative Humidity:	57%
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding from 2021-09-03 to 2021-09-15.

EUT operation mode: Transmitting

Test Result:Pass

Please refer to the Appendix

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

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

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 ≥ 1/T, where T is defined in section II.B.l.a).
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (< 500 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 (1MHz/RBW) to the measured result, whereas RBW (< 1 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 ℃
Relative Humidity:	57%
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding from 2021-09-03 to 2021-09-15.

EUT operation mode: Transmitting

Test Result:Pass

Please refer to the Appendix

APPENDIX

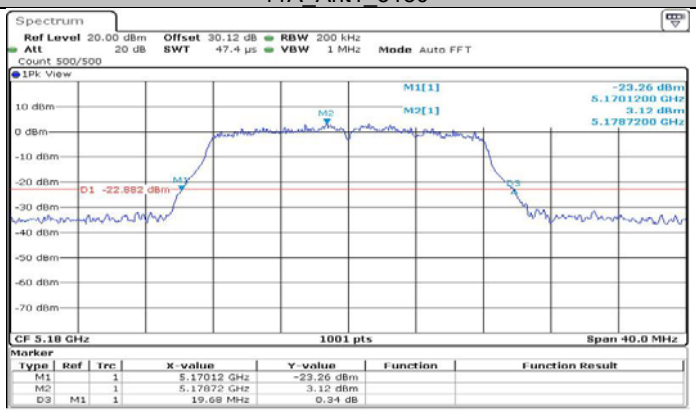
Appendix A1: Emission Bandwidth

Test Result

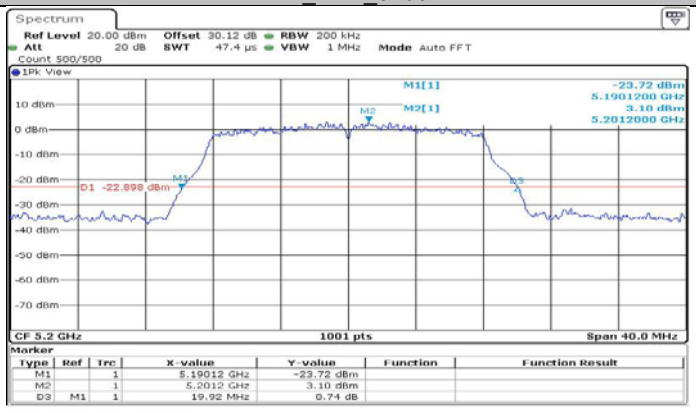
TestMode	Antenna	Channel	26db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	19.680	---	PASS
		5200	19.920	---	PASS
		5240	19.720	---	PASS
11N20SISO	Ant1	5180	20.160	---	PASS
		5200	20.040	---	PASS
		5240	20.200	---	PASS
11N40SISO	Ant1	5190	41.120	---	PASS
		5230	40.960	---	PASS
11AC20SISO	Ant1	5180	20.320	---	PASS
		5200	20.160	---	PASS
		5240	20.000	---	PASS
11AC40SISO	Ant1	5190	41.600	---	PASS
		5230	41.440	---	PASS
11AC80SISO	Ant1	5210	81.760	---	PASS

Test Graphs

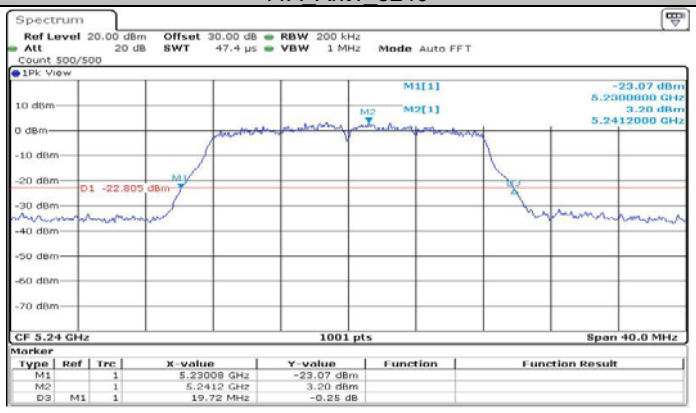
11A_Ant1_5180



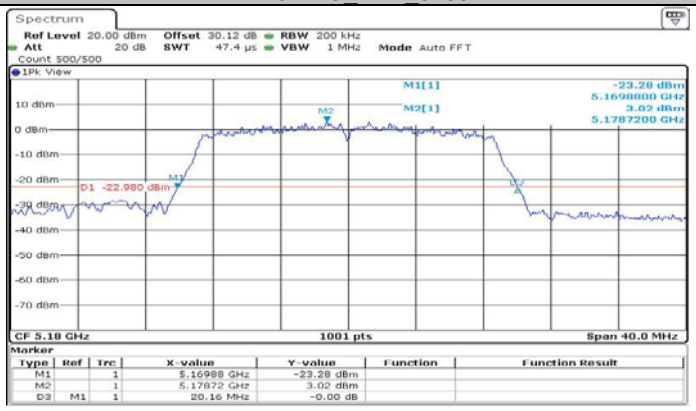
11A_Ant1_5200



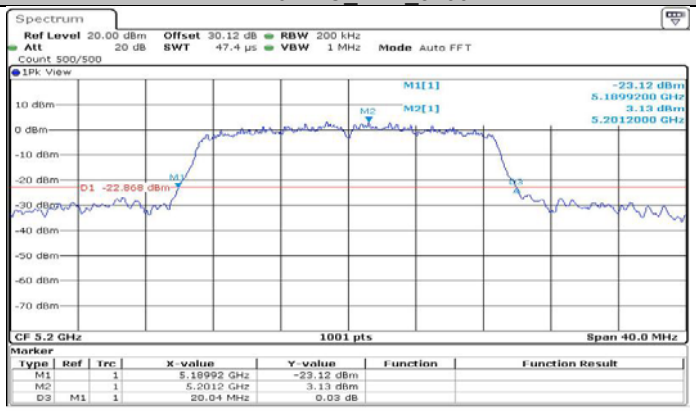
11A_Ant1_5240



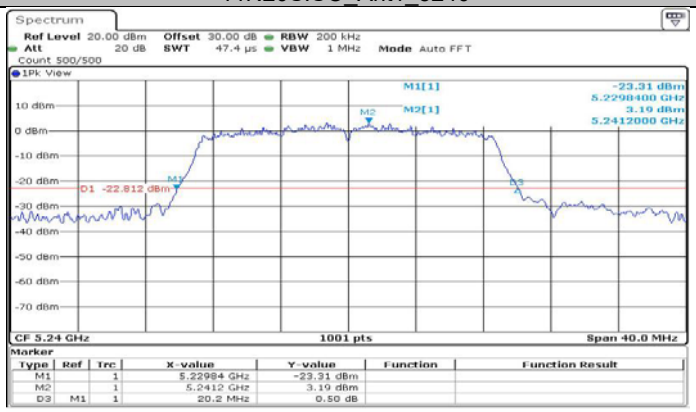
11N20SISO_Ant1_5180



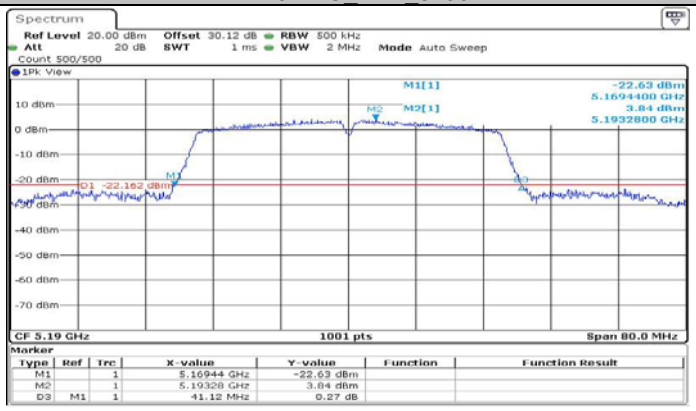
11N20SISO_Ant1_5200



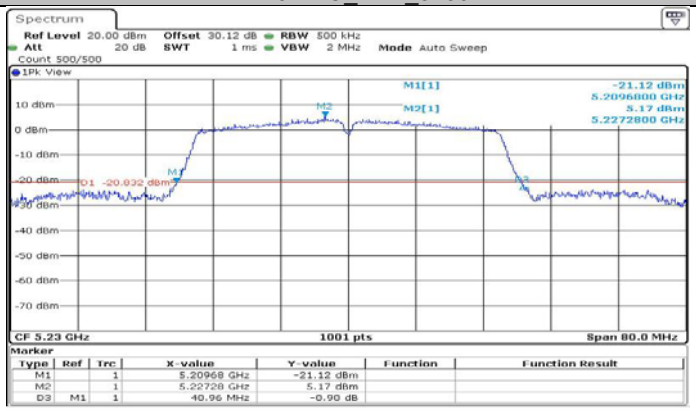
11N20SISO_Ant1_5240



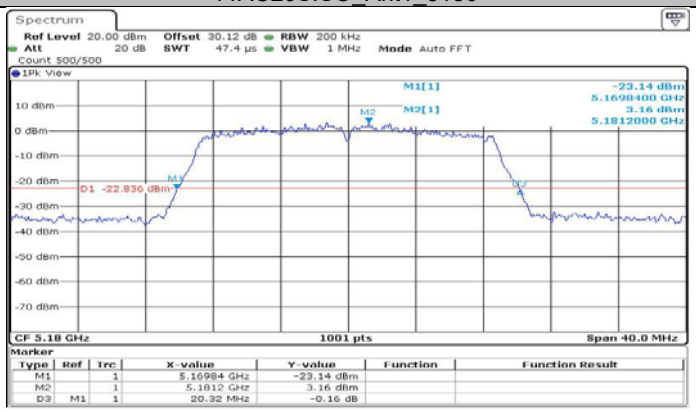
11N40SISO_Ant1_5190



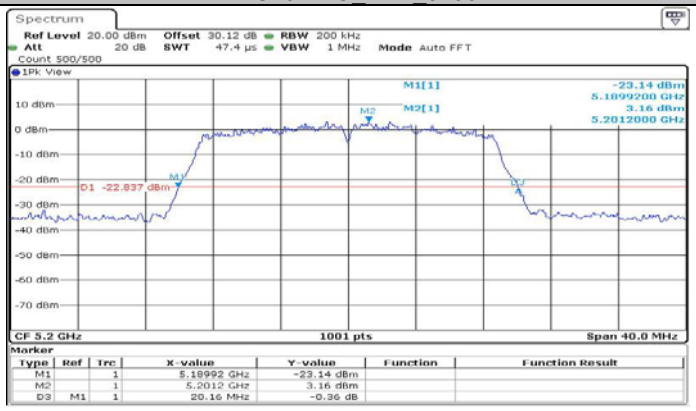
11N40SISO_Ant1_5230



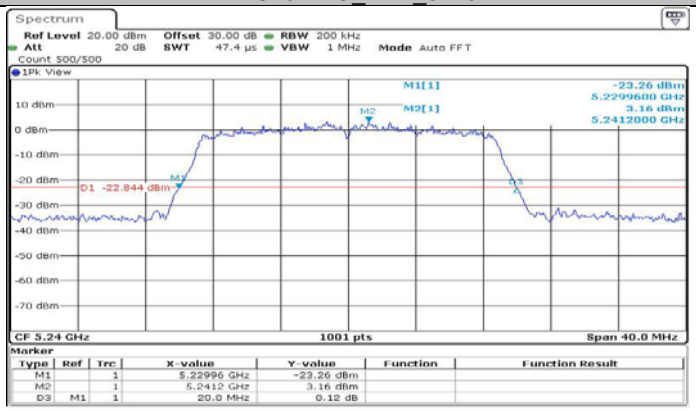
11AC20SISO_Ant1_5180



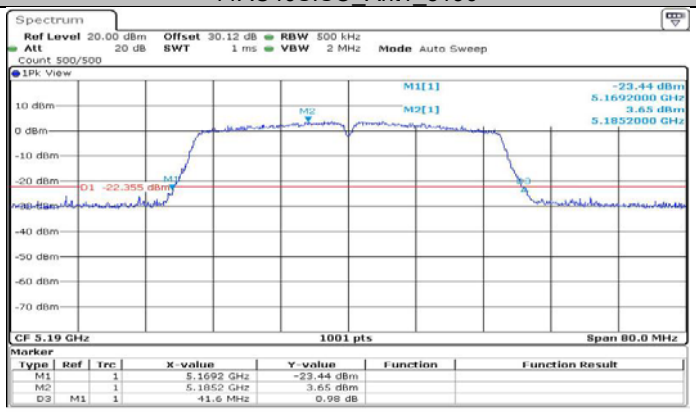
11AC20SISO_Ant1_5200



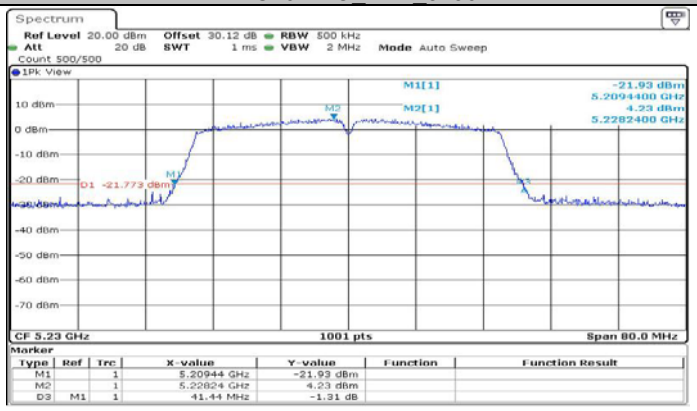
11AC20SISO_Ant1_5240



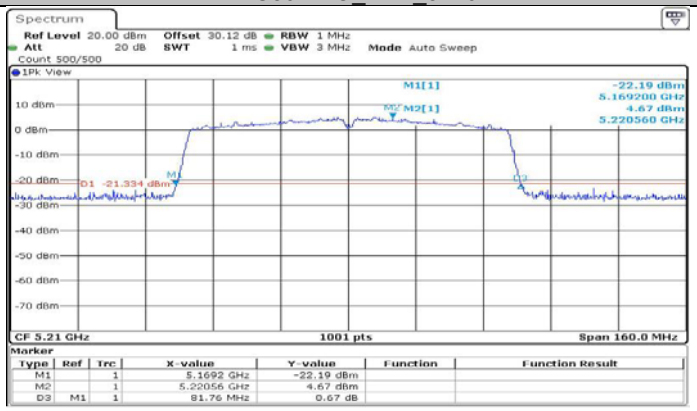
11AC40SISO_Ant1_5190



11AC40SISO_Ant1_5230



11AC80SISO_Ant1_5210



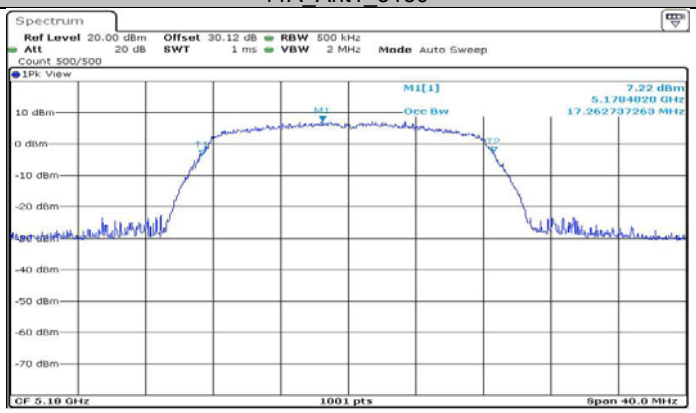
Appendix A2: Occupied channel bandwidth

Test Result

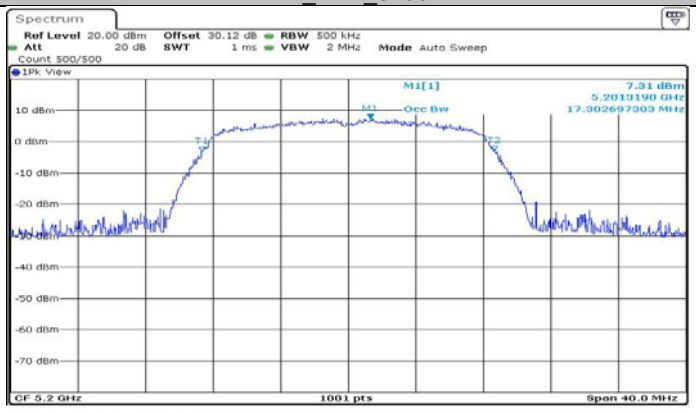
TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.263	---	PASS
		5200	17.303	---	PASS
		5240	17.263	---	PASS
		5745	17.303	---	PASS
		5785	17.303	---	PASS
		5825	17.263	---	PASS
11N20SISO	Ant1	5180	18.302	---	PASS
		5200	18.262	---	PASS
		5240	18.262	---	PASS
		5745	18.262	---	PASS
		5785	18.262	---	PASS
		5825	18.222	---	PASS
11N40SISO	Ant1	5190	36.923	---	PASS
		5230	36.763	---	PASS
		5755	37.003	---	PASS
		5795	37.163	---	PASS
11AC20SISO	Ant1	5180	18.102	---	PASS
		5200	18.062	---	PASS
		5240	18.102	---	PASS
		5745	18.142	---	PASS
		5785	18.142	---	PASS
		5825	18.142	---	PASS
11AC40SISO	Ant1	5190	36.763	---	PASS
		5230	36.683	---	PASS
		5755	36.763	---	PASS
		5795	36.763	---	PASS
11AC80SISO	Ant1	5210	75.285	---	PASS
		5775	75.764	---	PASS

Test Graphs

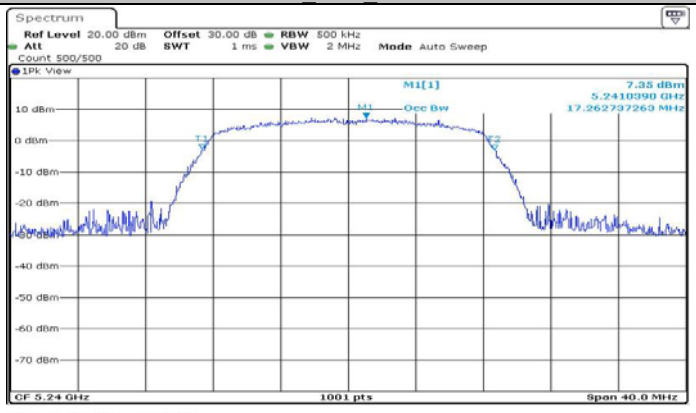
11A_Ant1_5180



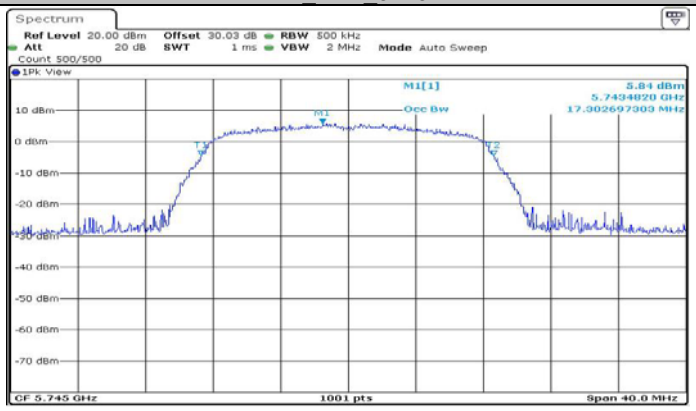
11A_Ant1_5200



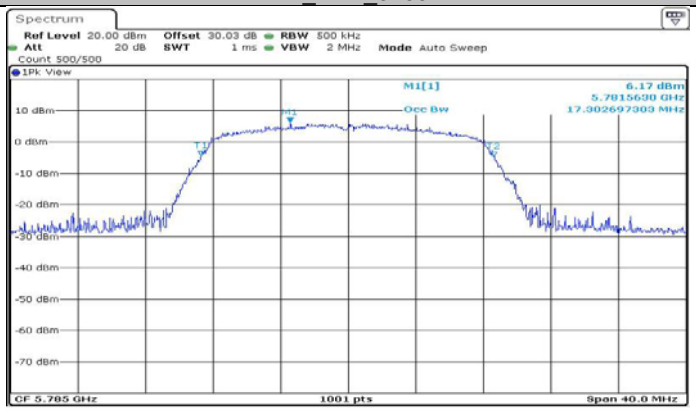
11A_Ant1_5240



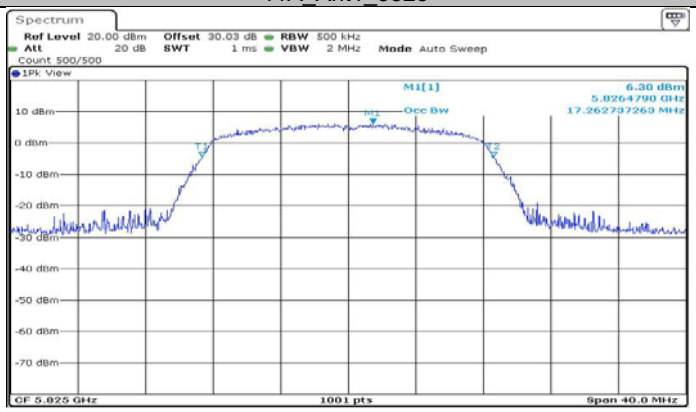
11A_Ant1_5745



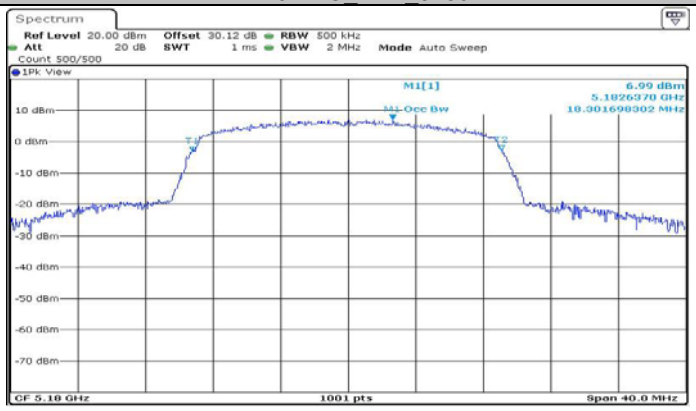
11A_Ant1_5785



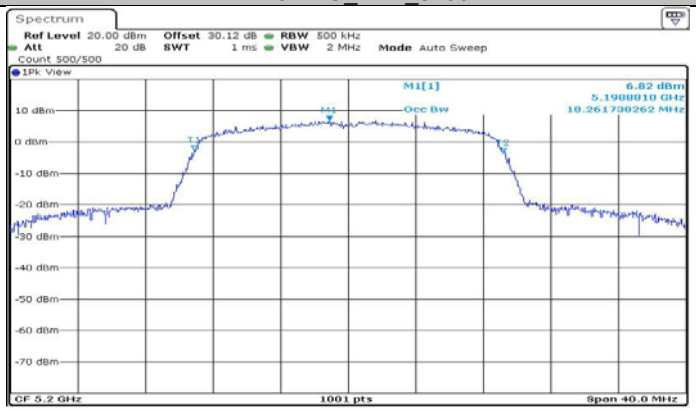
11A_Ant1_5825



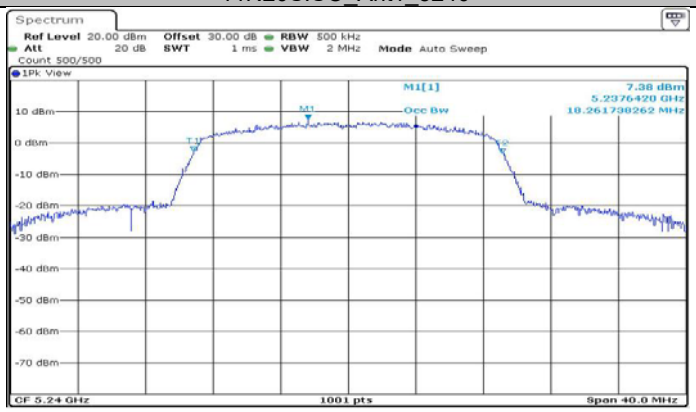
11N20SISO_Ant1_5180



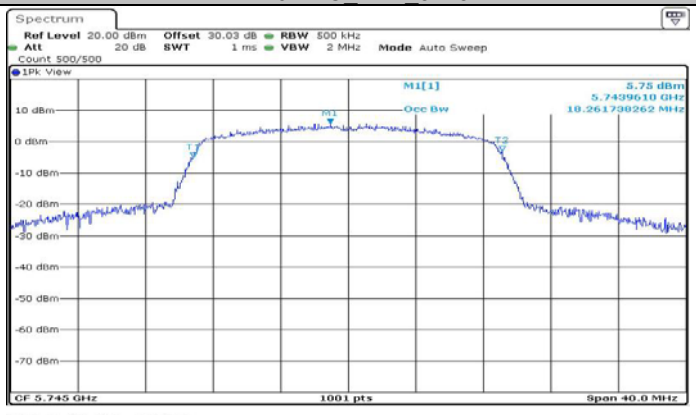
11N20SISO_Ant1_5200



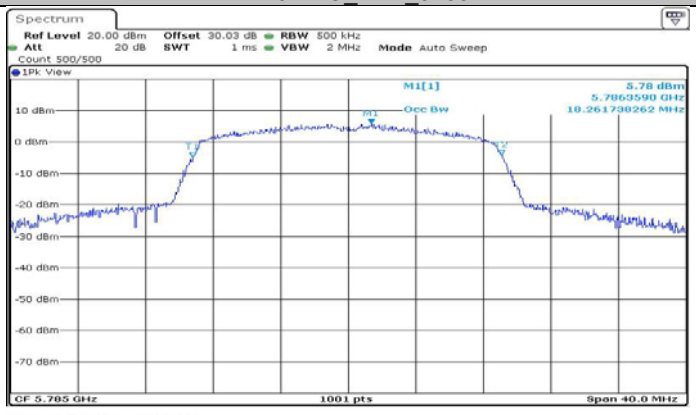
11N20SISO_Ant1_5240



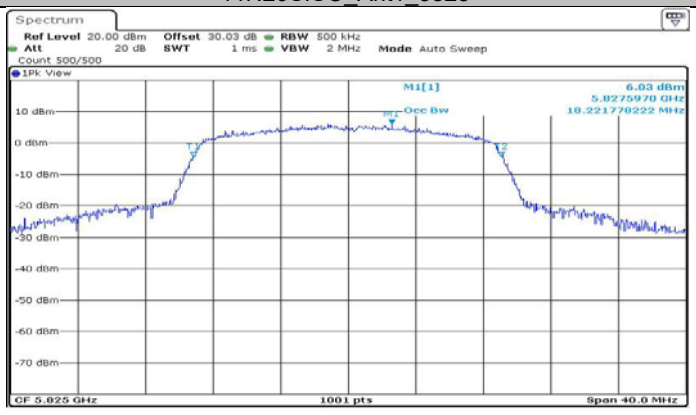
11N20SISO_Ant1_5745



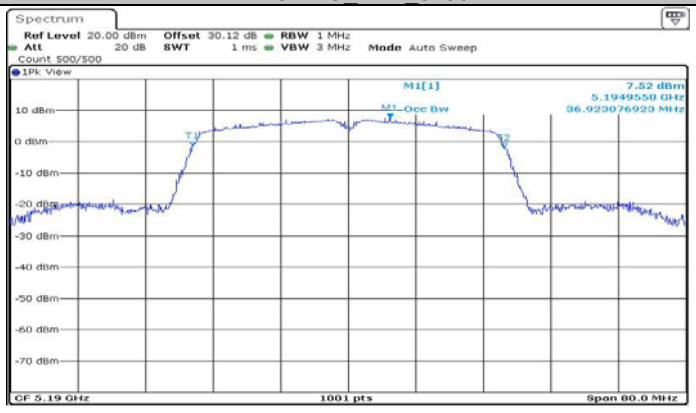
11N20SISO_Ant1_5785



11N20SISO_Ant1_5825



11N40SISO_Ant1_5190



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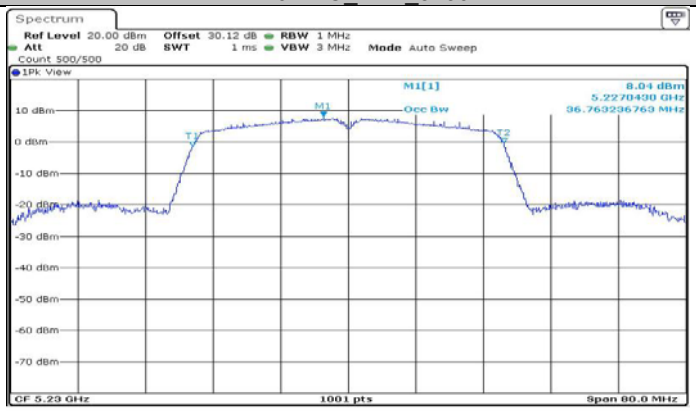

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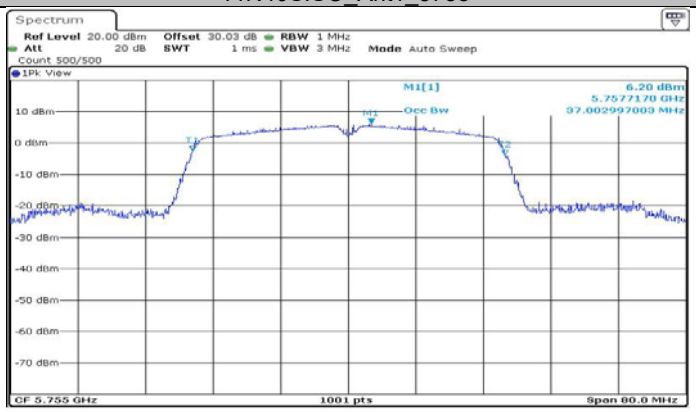

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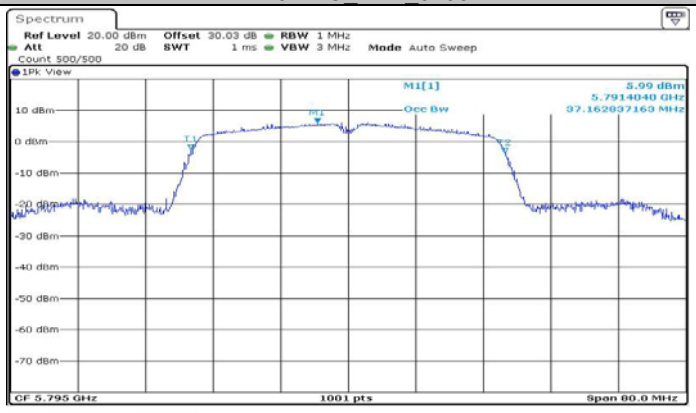
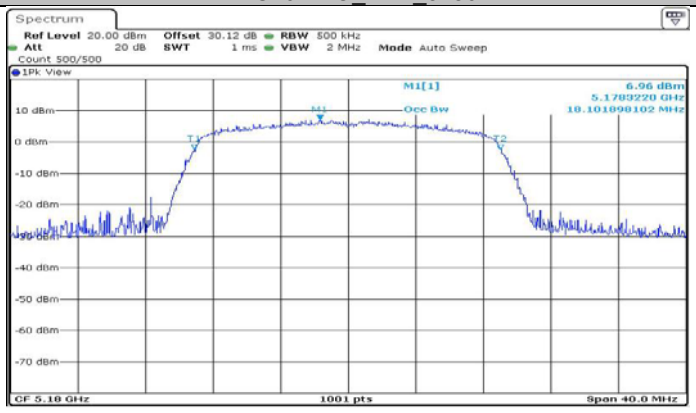


11AC20SISO_Ant1_5180



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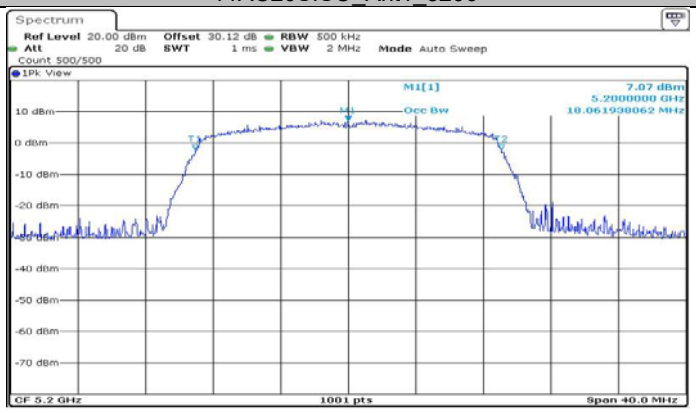
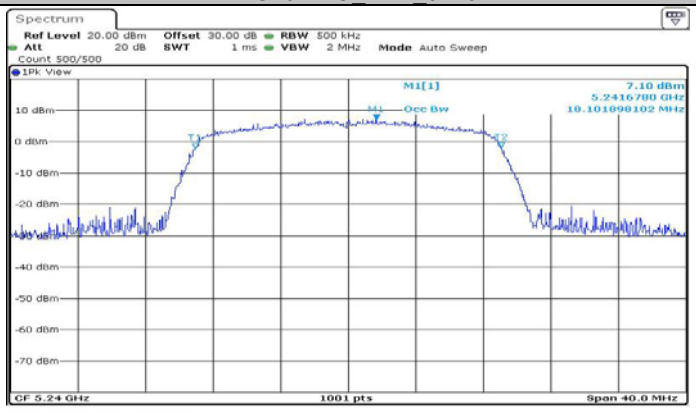
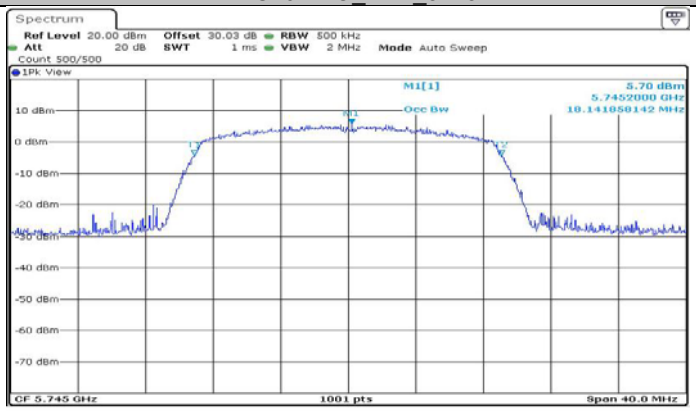


11AC20SISO_Ant1_5240



11AC20SISO_Ant1_5745



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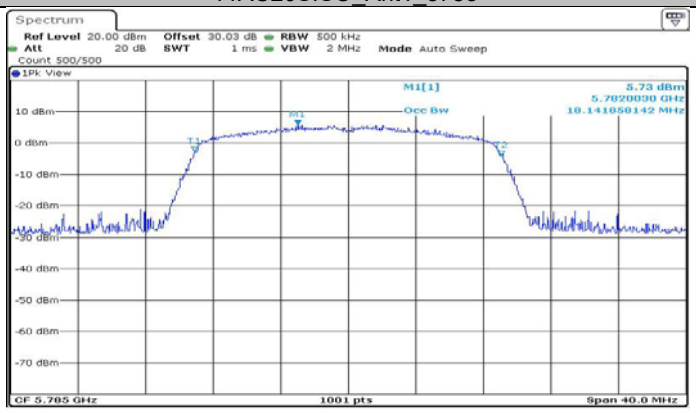

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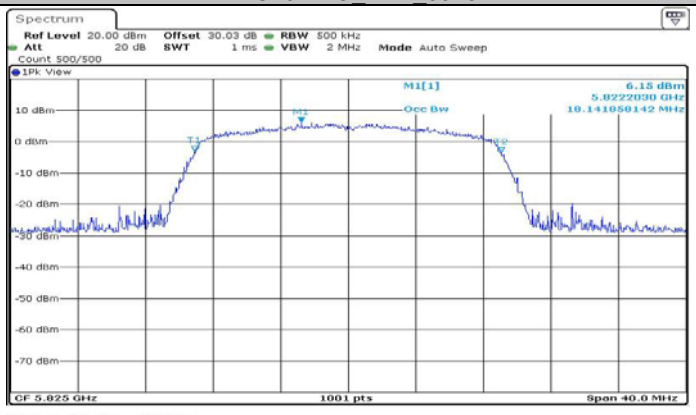
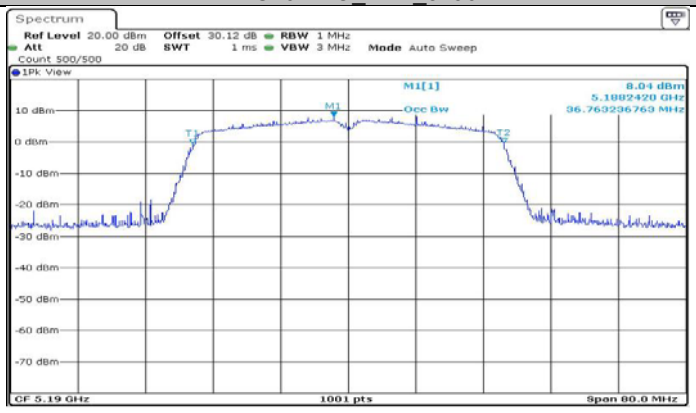
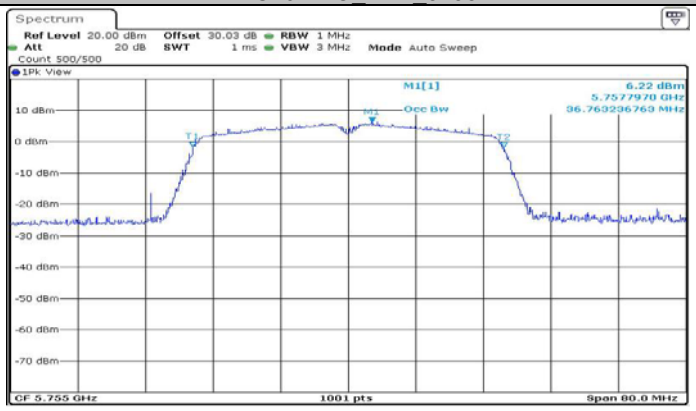


11AC40SISO_Ant1_5190

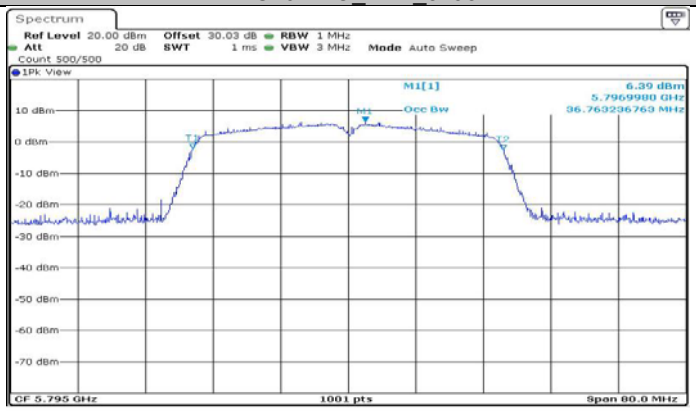


11AC40SISO_Ant1_5230

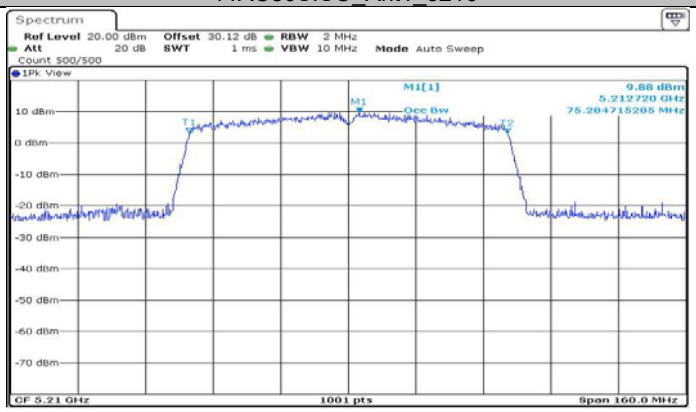
11AC40SISO_Ant1_5755



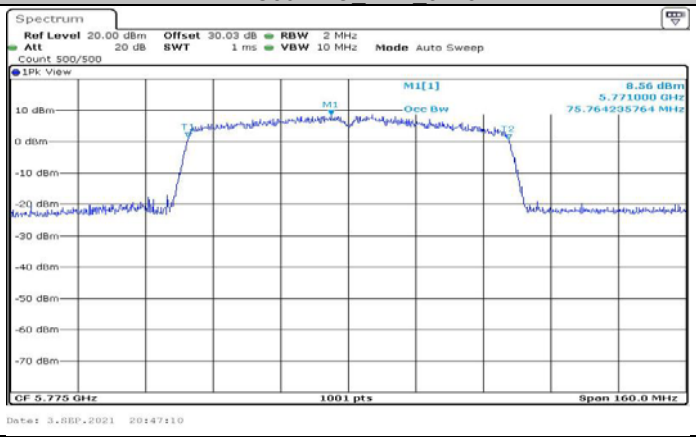
11AC40SISO_Ant1_5795



11AC80SISO_Ant1_5210



11AC80SISO_Ant1_5775



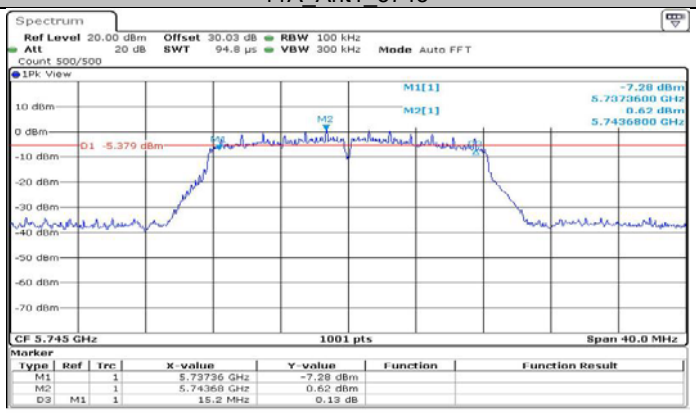
Appendix A3: Min emission bandwidth

Test Result

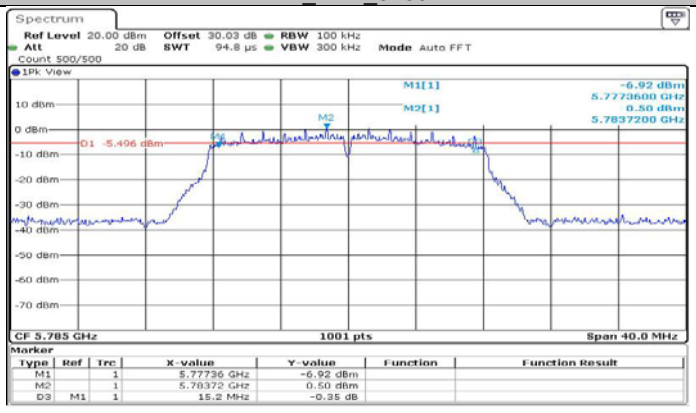
TestMode	Antenna	Channel	6db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	15.200	0.5	PASS
		5785	15.200	0.5	PASS
		5825	16.400	0.5	PASS
11N20SISO	Ant1	5745	15.200	0.5	PASS
		5785	15.760	0.5	PASS
		5825	15.200	0.5	PASS
11N40SISO	Ant1	5755	35.280	0.5	PASS
		5795	35.280	0.5	PASS
11AC20SISO	Ant1	5745	15.200	0.5	PASS
		5785	15.200	0.5	PASS
		5825	15.760	0.5	PASS
11AC40SISO	Ant1	5755	35.280	0.5	PASS
		5795	35.280	0.5	PASS
11AC80SISO	Ant1	5775	74.240	0.5	PASS

Test Graphs

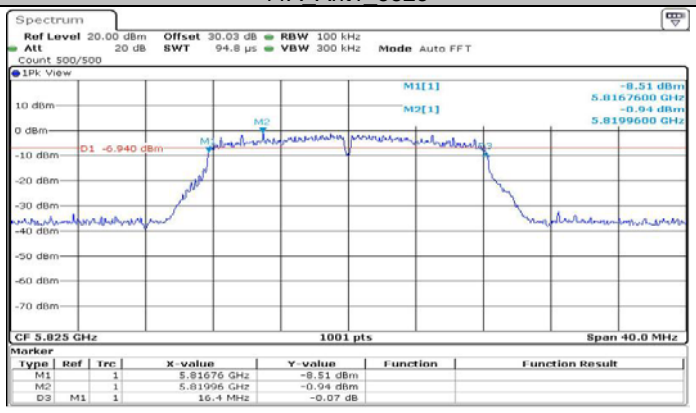
11A_Ant1_5745



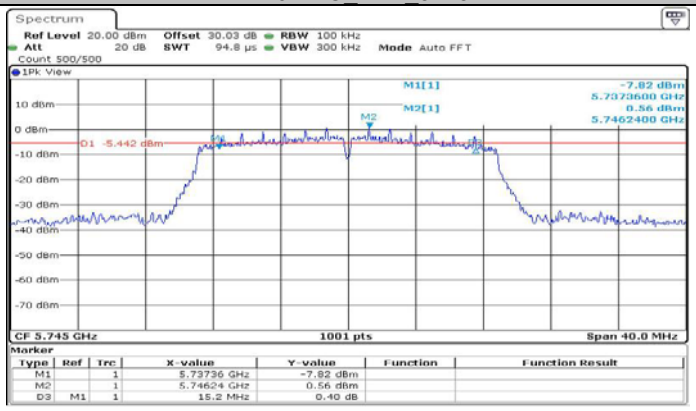
11A_Ant1_5785



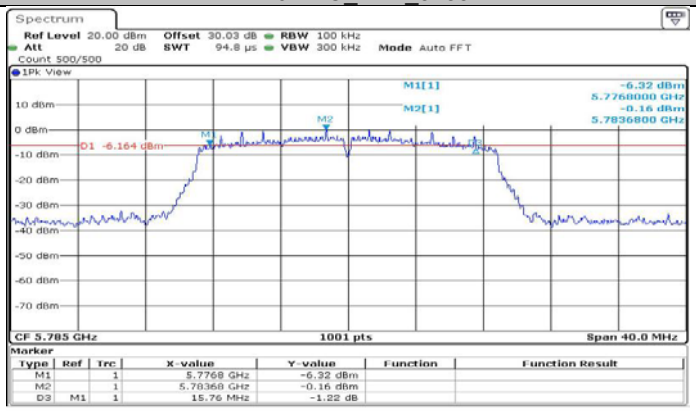
11A_Ant1_5825



11N20SISO_Ant1_5745



11N20SISO_Ant1_5785



11N20SISO_Ant1_5825