

TEST REPORT

Applicant Name: CAPTANA GMBH
Address: Bundesstrasse 16, Ettenheim, Germany 77955
Report Number: SZXX1240117-03999E-RF-00B
FCC ID: 2APO5-STOREEYE

Test Standard (s)

FCC PART 15.407

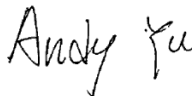
Sample Description

Product Type: Shelfcam
Model No.: StoreEye
Multiple Model(s) No.: StoreEye 120, StoreEye 80, StoreEye 60, StoreEye 50
Trade Mark: N/A
Date Received: 2024/01/17
Issue Date: 2024/11/28

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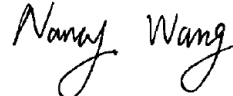
▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:



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RF Engineer

Approved By:



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RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZXX1240117-03999E-RF-00B	Original Report	2024/11/28

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Shelfcam
Tested Model	StoreEye
Multiple Model(s)	StoreEye 120, StoreEye 80, StoreEye 60, StoreEye 50
Frequency Range	5G Wi-Fi: 5250-5350MHz; 5470-5725MHz; 5725-5850MHz
Mode	802.11a/n20/n40
Maximum Conducted Average Output Power	5250-5350MHz: 10.28dBm(ANT 1), 12.28dBm(ANT 2) 5470-5725MHz: 11.00dBm(ANT 1), 13.07dBm(ANT 2) 5725-5850MHz: 13.96dBm(ANT 1), 14.24dBm(ANT 2)
Modulation Technique	OFDM
Antenna Specification [#]	ANT1/2: 4.05dBi (provided by the applicant)
Voltage Range	DC 3.7V from battery or DC 5V from USB port
Sample serial number	2GR5-2 for Conducted and Radiated Emissions Test 2GR5-1 for RF Conducted Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	N/A
<p>Note:</p> <p>1. The Multiple models are electrically identical with the test model except for model name, color and the field of view of the camera lens. Please refer to the declaration letter[#] for more detail, which was provided by manufacturer.</p> <p>2. The product is shipped without any data cables or adapters. The adapters and data cables in the test report are test tools provided by the laboratory.</p>	

Objective

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

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

Test Methodology

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

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

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF Frequency		213.55 Hz(k=2, 95% level of confidence)
RF output power, conducted		0.72 dB(k=2, 95% level of confidence)
Unwanted Emission, conducted		1.75 dB(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz-150kHz	3.94dB(k=2, 95% level of confidence)
	150kHz-30MHz	3.84dB(k=2, 95% level of confidence)
Radiated Emissions	9kHz - 30MHz	3.30dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	4.48dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	4.55dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	4.85dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.05dB(k=2, 95% level of confidence)
	1GHz - 6GHz	5.35dB(k=2, 95% level of confidence)
	6GHz - 18GHz	5.44dB(k=2, 95% level of confidence)
18GHz - 40GHz	5.16dB(k=2, 95% level of confidence)	
Temperature		±1°C
Humidity		±1%
Supply voltages		±0.4%

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

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

The system support 802.11a/n ht20/n ht40.

For 5250-5350MHz Band, 6 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
54	5270	62	5310
56	5280	64	5320

For 802.11a, 802.11n20 mode: channel 52, 56, 64 were tested;

For 802.11n40 mode: channel 54, 62 were tested;

For 5470-5725MHz Band, 16 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	120	5600
102	5510	124	5620
104	5520	126	5630
108	5540	128	5640
110	5550	132	5660
112	5560	134	5670
116	5580	136	5680
118	5590	140	5700

For 802.11a, 802.11n20 mode: channel 100, 116, 140 were tested;

For 802.11n40 mode: channel 102, 110, 134 were tested;

For 5725-5850MHz Band, 7 channels are provided to testing:

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

For 802.11a/n20 mode: channel 149, 157, 165 were tested;

For 802.11n40 mode: channel 151, 159 were tested;

EUT Exercise Software

“AmebaPRO2 mptool 1v9.7, QCOM”[#] software was used and power level as below. The software and power level was provided by the applicant. The device was tested with the worst case was performed as below:

U-NII	Mode	Data rate	Power Level [#]		
			Low Channel	Middle Channel	High Channel
5250-5350MHz	802.11a	6Mbps	19.5	19.5	19.5
	802.11n-HT20	MCS0	19	19	19
	802.11n-HT40	MCS0	19	/	19
5470-5725MHz	802.11a	6Mbps	19.5	19.5	19.5
	802.11n-HT20	MCS0	19	19	19
	802.11n-HT40	MCS0	19	19	19
5725 – 5850MHz	802.11a	6Mbps	19.5	19.5	19.5
	802.11n-HT20	MCS0	19	19	19
	802.11n-HT40	MCS0	19	/	19

Note: The RF chip RTL8735 is a 1T1R WLAN baseband, and the device with an antenna switch chip, the signals transmit on any one of the antennas which switched by the antenna switch chip automatically, the two antennas cannot be used at same time. All test was performed on the two antennas separately.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

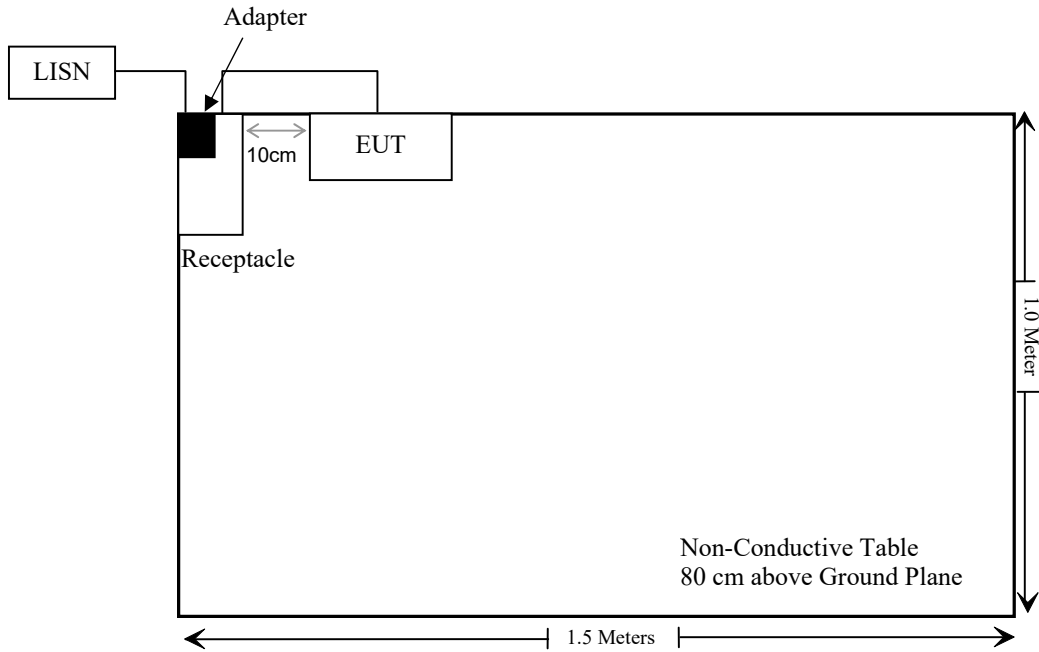
Manufacturer	Description	Model	Serial Number
TECNO	Adapter	U050TSA	AH07015321906
Dachuan	Adapter	DCT07W050100US-C1	00714US5220901608717

External I/O Cable

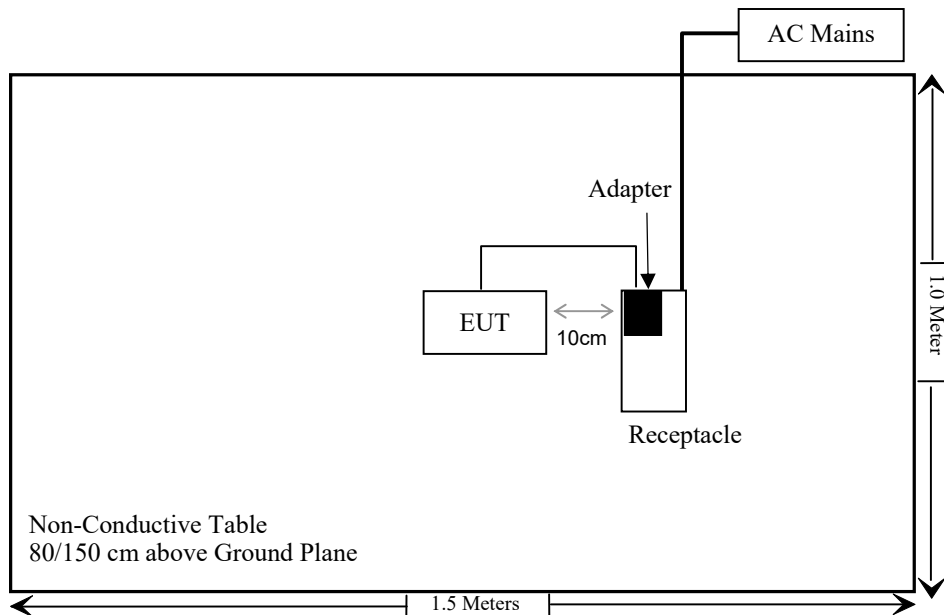
Cable Description	Length (m)	From Port	To
Un-shielding Un-Detachable USB Cable	1.2	LISN/ AC Mains	Receptacle
Un-shielding Detachable USB Cable	0.5 (white)	Adapter	EUT
Un-shielding Detachable USB Cable	0.3 (black)	Adapter	EUT

Block Diagram of Test Setup

For Conducted Emissions:



For Radiated Emissions



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307 (b) & §2.1091	MPE-Based Exemption	Compliant
§15.203	Antenna Requirement	Compliant
§15.407(b)(9)& §15.207(a)	Conducted Emissions	Compliant
§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliant
§15.407(a) (e)	26 dB Emission Bandwidth & 6dB Bandwidth	Compliant
§15.407(a)	Conducted Transmitter Output Power	Compliant
§15.407 (a)	Power Spectral Density	Compliant
§15.407 (h)	Transmit Power Control (TPC)	Not Applicable
§15.407 (h)	Dynamic Frequency Selection (DFS)	Compliant*

Compliant*: Please refer to the DFS report SZXX1240117-03999E-RF-00C.

Not Applicable: The supplier declared that the equipment has no this function.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2024/01/16	2025/01/15
Rohde & Schwarz	LISN	ENV216	101613	2024/01/16	2025/01/15
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2023/08/03	2024/08/02
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2023/08/03	2024/08/02
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
Radiated Emissions Test (below 30MHz)					
R&S	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	Chamber A Cable 1	N/A	2024/06/18	2025/06/17
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
Unknown	Cable	2Y194	0735	2024/05/21	2025/05/20
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
Radiated Emissions Test (30MHz~1GHz)					
R&S	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2023/06/08	2024/06/07
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
ETS	Passive Loop Antenna	6512	29604	2023/07/07	2026/07/06
Unknown	Cable	Chamber Cable 1	F-03-EM236	2023/08/03	2024/08/02
Unknown	Cable	Chamber Cable 4	EC-007	2023/08/03	2024/08/02
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emissions Test (above 1GHz)					
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2024/03/27	2025/03/26
COM-POWER	Pre-amplifier	PA-122	181919	2023/06/29	2024/06/28
COM-POWER	Pre-amplifier	PA-122	181919	2024/06/18	2025/06/17
Schwarzbeck	Horn Antenna	BBHA9120D(1201)	1143	2023/07/26	2026/07/25
Unknown	RF Cable	KMSE	0735	2023/10/08	2024/10/07
Unknown	RF Cable	KMSE	735	2024/06/18	2025/06/17
Unknown	RF Cable	UFA147	219661	2023/10/08	2024/10/07
Unknown	RF Cable	UFA147	219661	2024/06/18	2025/06/17
SNSD	5G Band Reject filter	BSF5150-5850MN-0899-004	5G filter	2023/08/03	2024/08/02
SNSD	5G Band Reject filter	BSF5150-5850MN-0899-004	5G filter	2024/06/27	2025/06/26
A.H.System	Pre-amplifier	PAM-1840VH	190	2023/08/02	2024/08/01
A.H.System	Pre-amplifier	PAM-1840VH	190	2024/06/18	2025/06/17
Electro-Mechanics Co	Horn Antenna	3116	9510-2270	2023/09/18	2026/09/17
UTIFLEX	RF Cable	NO. 13	232308-001	2023/08/03	2024/08/02
UTIFLEX	RF Cable	NO. 13	232308-001	2024/06/18	2025/06/17
RF Conducted Test					
Tonscend	RF control Unit	JS0806-2	19D8060154	2023/09/06	2024/09/05
Tonscend	RF control Unit	JS0806-2	19D8060154	2024/08/06	2025/08/05
Rohde & Schwarz	Signal and Spectrum Analyzer	FSV40	101473	2024/01/16	2025/01/15
Narda	20dB Attenuator	99899	0107	2023/07/04	2024/07/03
Narda	20dB Attenuator	99899	0107	2024/06/27	2025/06/26
Unknown	RF Cable	65475	01670515	2023/07/04	2024/07/03
Unknown	RF Cable	65475	01670515	2024/06/27	2025/06/26

* **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 1.1307 (B) & §2.1091- MPE-BASED EXEMPTION

Applicable Standard

According to 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.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power (ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2f$.
1,500-100,000	$19.2R^2$.

R is the minimum separation distance in meters

f = frequency in MHz

Result

Mode	Frequency (MHz)	Tune up conducted power [#]	Antenna Gain [#]		ERP		Evaluation Distance (m)	ERP Limit (mW)
		(dBm)	(dBi)	(dBd)	(dBm)	(mW)		
5.3G Wi-Fi	5260-5320	12.5	4.05	1.9	14.4	27.54	0.2	768
5.6G Wi-Fi	5500-5700	13.5	4.05	1.9	15.4	34.67	0.2	768
5.8G Wi-Fi	5745-5825	14.5	4.05	1.9	16.4	43.65	0.2	768

Note: The tune up conducted power and antenna gain was declared by the applicant.

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

Result: Compliant

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.
- c. 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 antennas which was permanently attached, and the maximum antenna gain[#] is 4.05dBi, fulfill the requirement of this section. Please refer to the EUT photos.

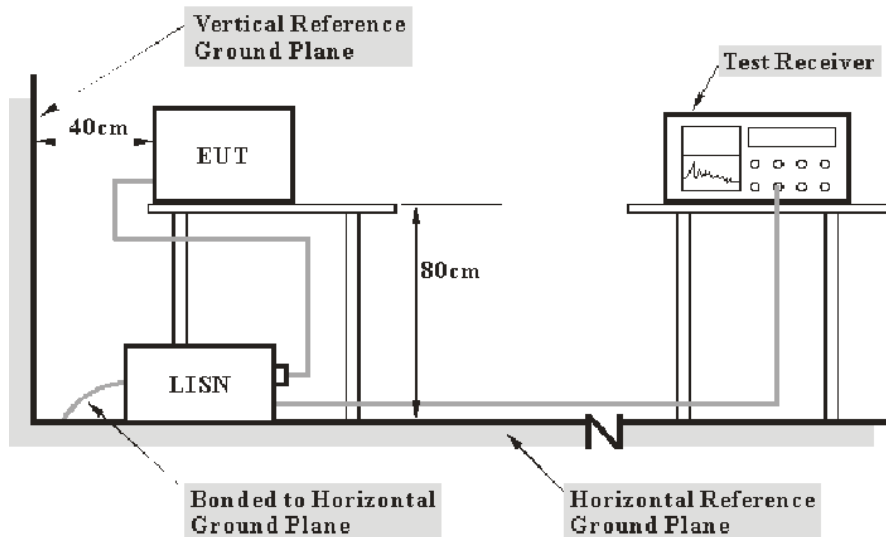
Result: Compliant

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

Applicable Standard

FCC §15.207, §15.407(b) (6)

EUT Setup



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

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

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

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

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

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

Test Procedure

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

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

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

Factor & Over Limit Calculation

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

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

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

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

Note: The term "cable loss" refers to the combination of a cable and a 10dB transient limiter (attenuator).

Test Data

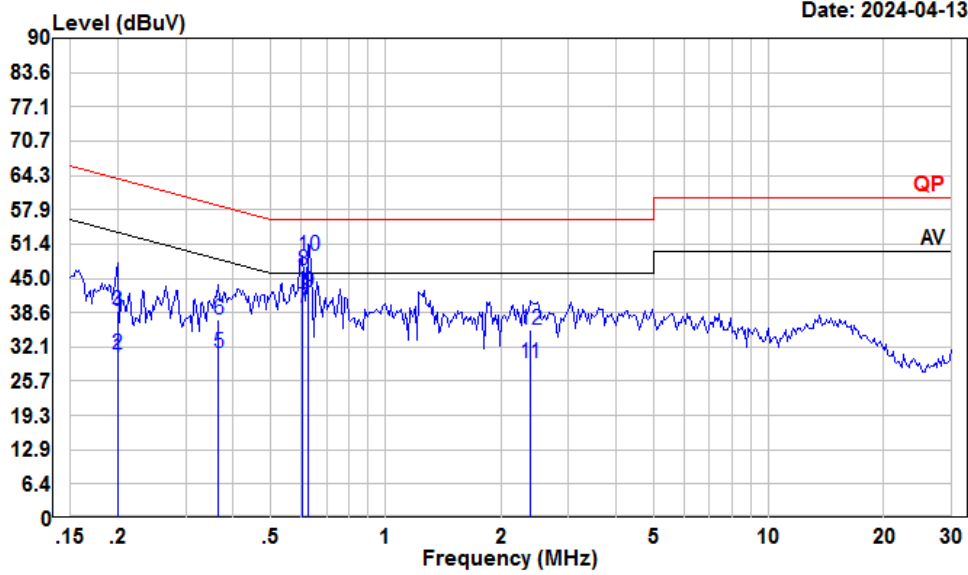
Environmental Conditions

Temperature:	26 °C
Relative Humidity:	60 %
ATM Pressure:	101 kPa

The testing was performed by Macy Shi on 2024-04-13.

EUT operation mode: Transmitting (Maximum output power mode, 802.11a, 5745MHz, ANT 2)

AC 120V/60 Hz, Line

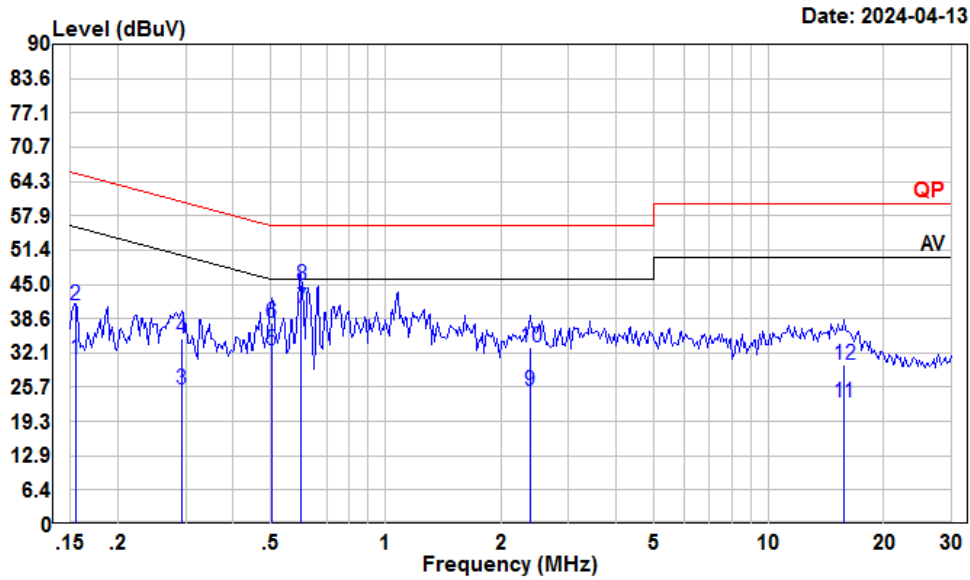


Date: 2024-04-13

Condition: Line
 Project : SZXX1240117-03999E-RF
 Tester : Macy shi
 Note : 5G WIFI

	Read Freq	Read Level	LISN Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.20	9.38	30.27	10.80	10.09	53.62	-23.35	Average
2	0.20	9.88	30.77	10.80	10.09	53.62	-22.85	Average
3	0.20	18.01	38.90	10.80	10.09	63.62	-24.72	QP
4	0.20	17.40	38.29	10.80	10.09	63.62	-25.33	QP
5	0.37	10.35	31.13	10.60	10.18	48.61	-17.48	Average
6	0.37	16.58	37.36	10.60	10.18	58.61	-21.25	QP
7	0.61	18.60	39.32	10.50	10.22	46.00	-6.68	Average
8	0.61	25.70	46.42	10.50	10.22	56.00	-9.58	QP
9	0.63	21.69	42.41	10.50	10.22	46.00	-3.59	Average
10	0.63	28.37	49.09	10.50	10.22	56.00	-6.91	QP
11	2.38	8.39	29.12	10.52	10.21	46.00	-16.88	Average
12	2.38	14.53	35.26	10.52	10.21	56.00	-20.74	QP

AC 120V/60 Hz, Neutral



Date: 2024-04-13

Condition: Neutral
 Project : SZXX1240117-03999E-RF
 Tester : Macy shi
 Note : 5G WIFI

	Read Freq	Read Level	LISN Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.15	10.24	30.97	10.58	10.15	55.74	-24.77	Average
2	0.15	20.22	40.95	10.58	10.15	65.74	-24.79	QP
3	0.29	4.62	25.27	10.52	10.13	50.46	-25.19	Average
4	0.29	14.14	34.79	10.52	10.13	60.46	-25.67	QP
5	0.50	11.86	32.71	10.70	10.15	46.00	-13.29	Average
6	0.50	16.85	37.70	10.70	10.15	56.00	-18.30	QP
7	0.60	19.74	40.66	10.70	10.22	46.00	-5.34	Average
8	0.60	23.93	44.85	10.70	10.22	56.00	-11.15	QP
9	2.38	4.34	24.95	10.40	10.21	46.00	-21.05	Average
10	2.38	12.59	33.20	10.40	10.21	56.00	-22.80	QP
11	15.72	1.91	22.79	10.78	10.10	50.00	-27.21	Average
12	15.72	9.17	30.05	10.78	10.10	60.00	-29.95	QP

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

Applicable Standard

FCC §15.407 (b); §15.209; §15.205;

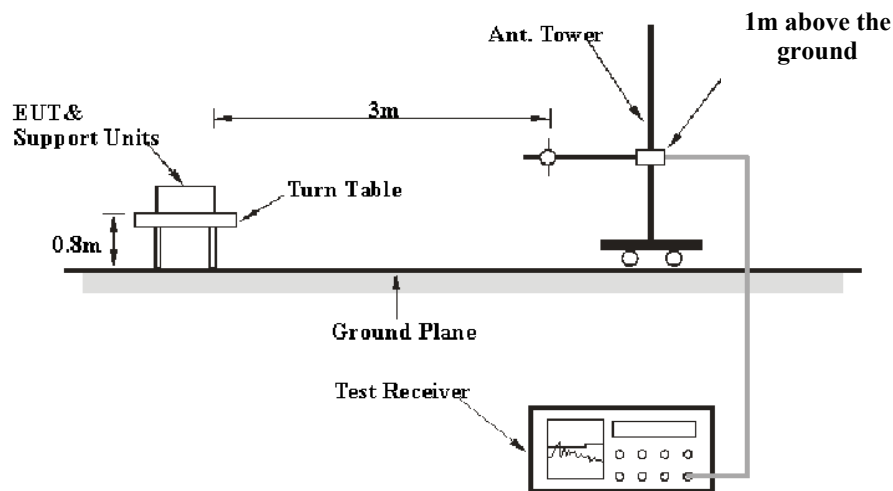
(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

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

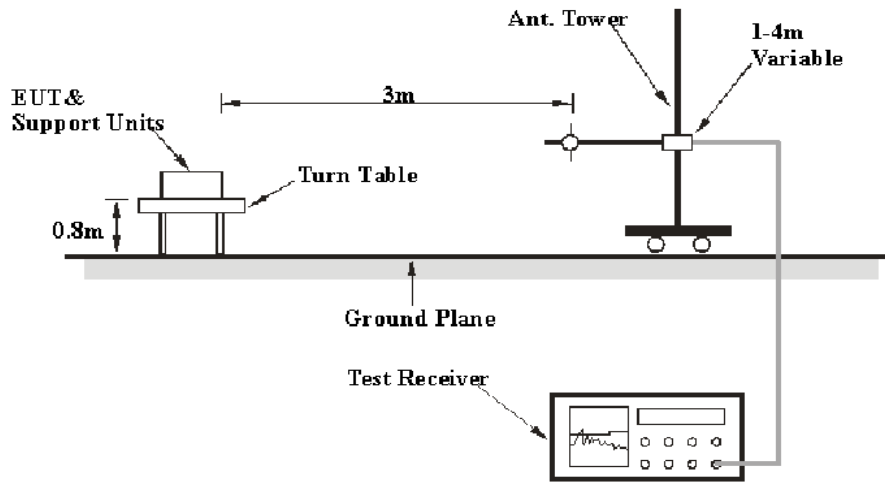
Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

EUT Setup

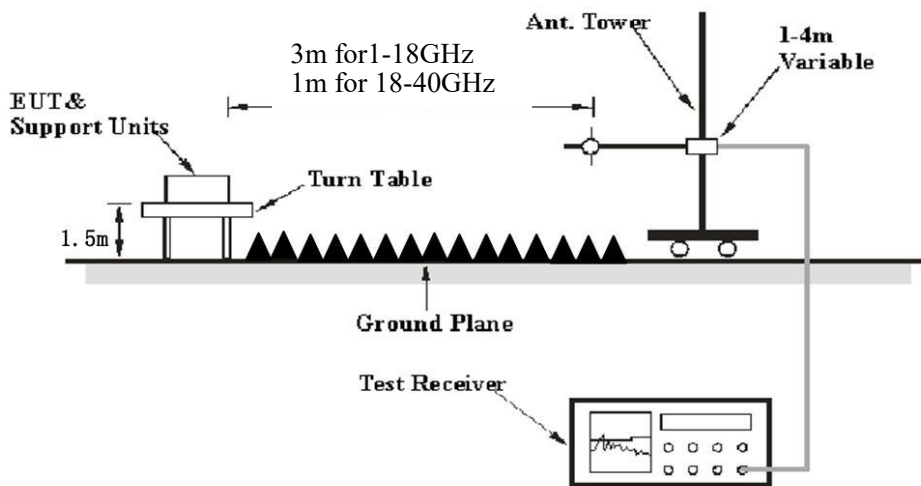
9 kHz-30MHz:



30MHz-1GHz:



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 9 kHz to 40 GHz.

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

9 kHz-1GHz:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
9 kHz – 150 kHz	/	/	200 Hz	QP
	300 Hz	1 kHz	/	PK
150 kHz – 30 MHz	/	/	9 kHz	QP
	10 kHz	30 kHz	/	PK
30 MHz – 1000 MHz	/	/	120 kHz	QP
	100 kHz	300 kHz	/	PK

1-40GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
AV	>98%	1MHz	10 Hz
	<98%	1MHz	$\geq 1/T$

Note: T is minimum transmission duration

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

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.

All final data was recorded in Quasi-peak detection mode except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, average detection modes for frequency bands 9–90 kHz and 110–490 kHz, peak and average detection modes for frequencies above 1 GHz.

For 9 kHz-30MHz, the report shall list the six emissions with the smallest margin relative to the limit, for each of the three antenna orientations (parallel, perpendicular, and ground-parallel) unless the margin is greater than 20 dB.

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

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

where

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

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

Factor & Over Limit/Margin Calculation

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

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

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

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

Test Data

Environmental Conditions

Temperature:	23~25.6 °C
Relative Humidity:	50~55 %
ATM Pressure:	101 kPa

The testing was performed by Anson Su on 2024-11-28 for below 30MHz, Warren Huang on 2024-03-14 for 30MHz~1GHz and Zenos Qiao and Tyler Wu from 2024-04-10 to 2024-10-12 for above 1GHz.

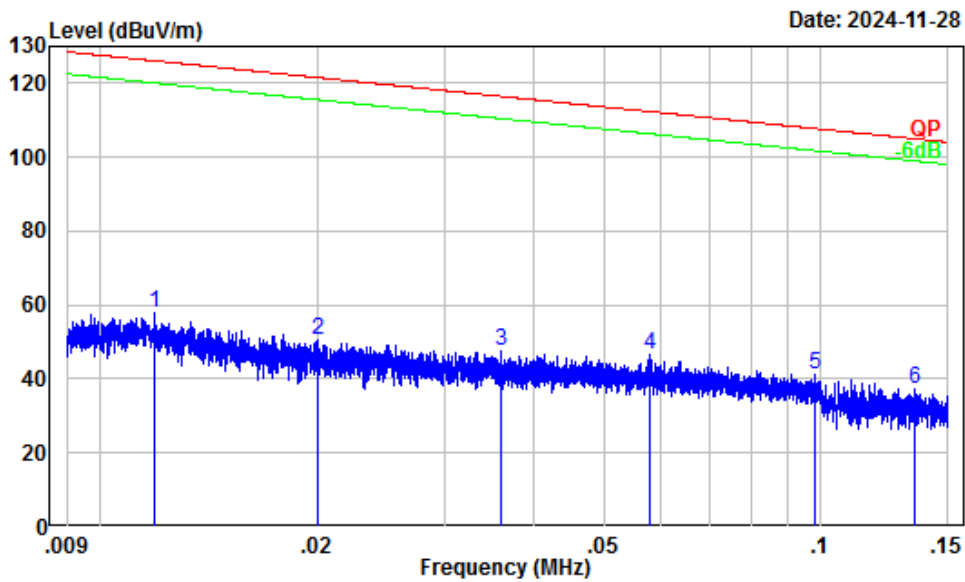
EUT operation mode: Transmitting

Note: After pre-scan in the X, Y and Z axes of orientation, the worst case is below.

9 kHz-30MHz: (Maximum output power mode, 802.11a 5745MHz ANT 2)

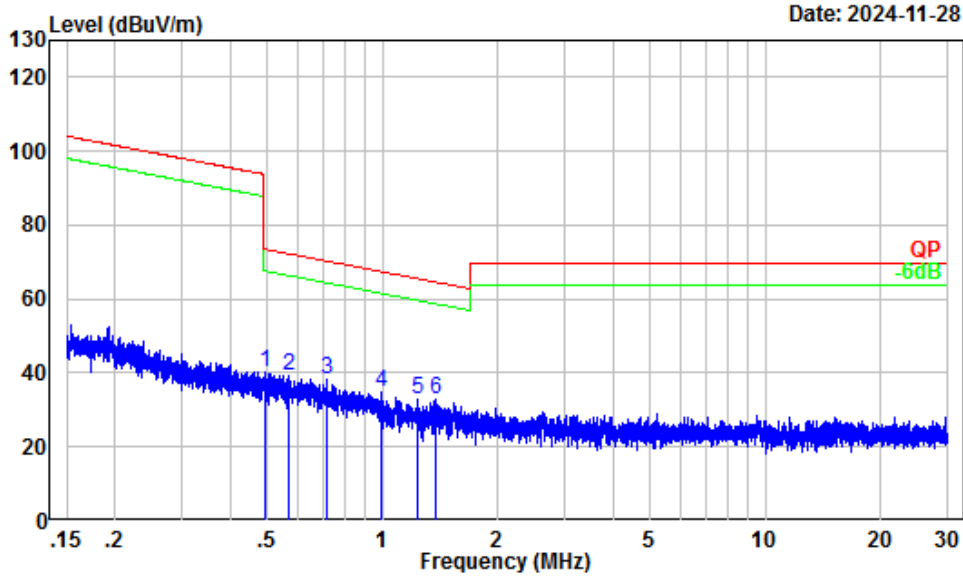
Note: When the test result of peak was less than the limit of QP/Average more than 6dB, just peak value were recorded.

Parallel (worst case)



Site : Chamber A
 Condition : 3m
 Project Number : SZXX1240117-03999E-RF
 Test Mode : 5G WIFI Transmitting
 Detector PK RBW: 200Hz
 Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	31.93	25.72	57.65	126.07	-68.42	Peak
2	0.02	30.38	20.00	50.38	121.55	-71.17	Peak
3	0.04	27.88	19.55	47.43	116.50	-69.07	Peak
4	0.06	25.60	20.96	46.56	112.34	-65.78	Peak
5	0.10	22.11	19.05	41.16	107.75	-66.59	Peak
6	0.13	19.96	17.32	37.28	105.02	-67.74	Peak

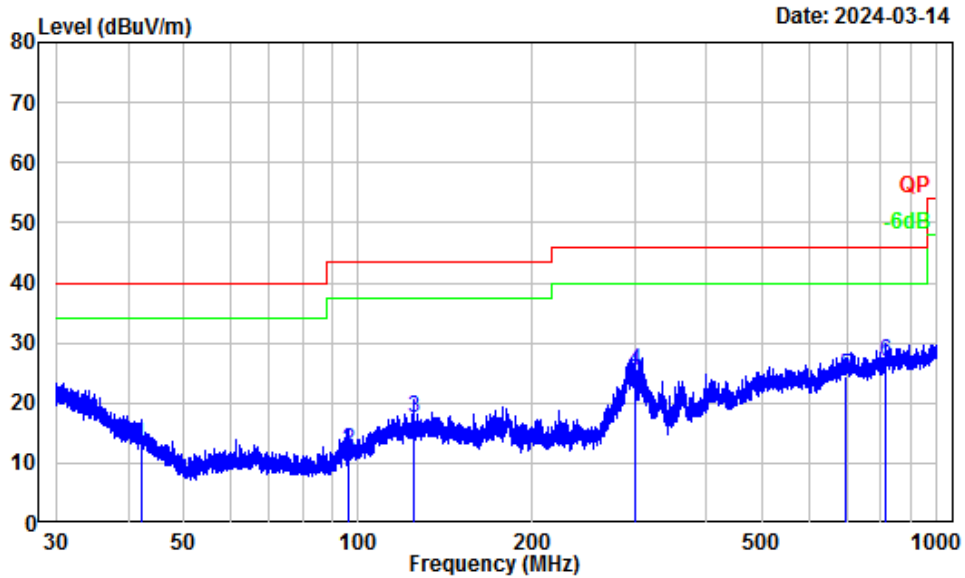


Site : Chamber A
 Condition : 3m
 Project Number : SZXX1240117-03999E-RF
 Test Mode : 5G WIFI Transmitting
 Detector PK RBW: 200Hz
 Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.49	6.51	33.77	40.28	73.73	-33.45	Peak
2	0.57	5.56	33.85	39.41	72.49	-33.08	Peak
3	0.72	3.70	34.42	38.12	70.40	-32.28	Peak
4	1.00	1.21	33.57	34.78	67.48	-32.70	Peak
5	1.23	0.55	32.20	32.75	65.62	-32.87	Peak
6	1.39	0.12	32.51	32.63	64.58	-31.95	Peak

30 MHz–1 GHz: (Maximum output power mode, 802.11a, 5745MHz, ANT 2)

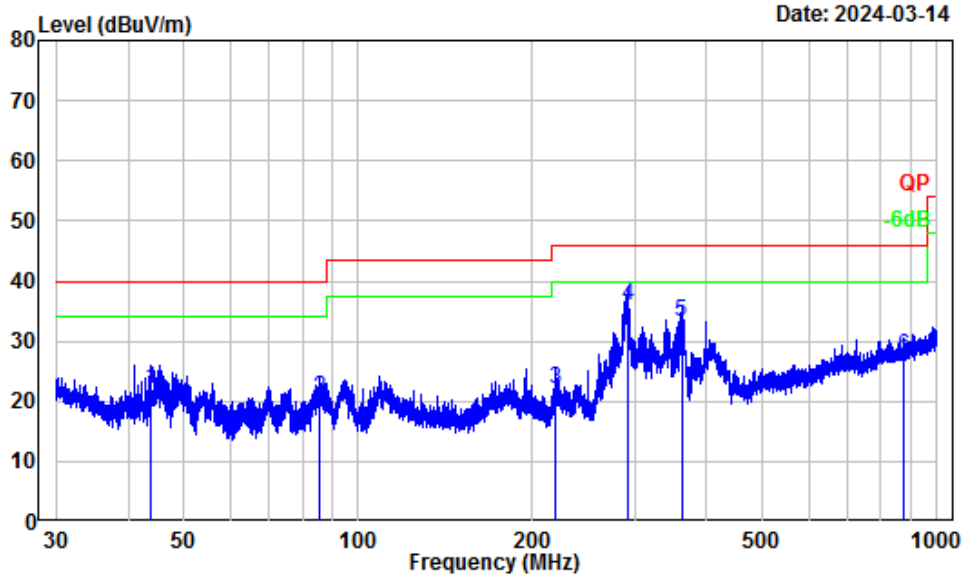
Horizontal



Site : Chamber A
 Condition : 3m Horizontal
 Project Number: SZXX1240117-03999E-RF
 Note : 5G WIFI
 Tester : Warren Huang

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	42.06	-11.71	24.79	13.08	40.00	-26.92	QP
2	96.48	-14.73	26.87	12.14	43.50	-31.36	QP
3	125.01	-10.32	27.76	17.44	43.50	-26.06	QP
4	299.97	-9.96	35.42	25.46	46.00	-20.54	QP
5	695.64	-1.59	26.15	24.56	46.00	-21.44	QP
6	813.82	-0.34	27.16	26.82	46.00	-19.18	QP

Vertical



Site : Chamber A
 Condition : 3m Vertical
 Project Number: SZXX1240117-03999E-RF
 Note : 5G WIFI
 Tester : Warren Huang

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	43.81	-14.05	36.11	22.06	40.00	-17.94	QP
2	85.52	-17.30	37.70	20.40	40.00	-19.60	QP
3	219.27	-12.24	34.32	22.08	46.00	-23.92	QP
4	291.93	-10.66	46.44	35.78	46.00	-10.22	QP
5	361.87	-9.54	42.60	33.06	46.00	-12.94	QP
6	874.48	0.25	27.30	27.55	46.00	-18.45	QP

ANT1

Above 1GHz:

5250-5350MHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11a							
5260MHz							
5092.37	55.63	PK	H	3.07	58.70	74	-15.30
5092.37	41.75	AV	H	3.07	44.82	54	-9.18
5073.26	55.18	PK	V	2.97	58.15	74	-15.85
5073.26	41.02	AV	V	2.97	43.99	54	-10.01
10520.00	45.36	PK	H	13.05	58.41	68.2	-9.79
10520.00	45.02	PK	V	13.05	58.07	68.2	-10.13
5280MHz							
10560.00	45.49	PK	H	13.02	58.51	68.2	-9.69
10560.00	45.31	PK	V	13.02	58.33	68.2	-9.87
5320MHz							
5356.48	54.76	PK	H	2.92	57.68	74	-16.32
5356.48	40.78	AV	H	2.92	43.70	54	-10.30
5370.00	54.42	PK	V	2.94	57.36	74	-16.64
5370.00	40.38	AV	V	2.94	43.32	54	-10.68
10640.00	45.71	PK	H	13.19	58.90	74	-15.10
10640.00	31.68	AV	H	13.19	44.87	54	-9.13
10640.00	45.67	PK	V	13.19	58.86	74	-15.14
10640.00	31.25	AV	V	13.19	44.44	54	-9.56

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n20							
5260MHz							
5079.56	55.57	PK	H	2.97	58.54	74	-15.46
5079.56	41.36	AV	H	2.97	44.33	54	-9.67
5128.27	55.29	PK	V	2.77	58.06	74	-15.94
5128.27	41.15	AV	V	2.77	43.92	54	-10.08
10520.00	45.27	PK	H	13.05	58.32	68.2	-9.88
10520.00	44.95	PK	V	13.05	58.00	68.2	-10.20
5280MHz							
10560.00	45.49	PK	H	13.02	58.51	68.2	-9.69
10560.00	45.24	PK	V	13.02	58.26	68.2	-9.94
5320MHz							
5433.65	55.19	PK	H	3.27	58.46	74	-15.54
5433.65	40.97	AV	H	3.27	44.24	54	-9.76
5457.89	55.02	PK	V	3.59	58.61	74	-15.39
5457.89	40.84	AV	V	3.59	44.43	54	-9.57
10640.00	45.78	PK	H	13.19	58.97	74	-15.03
10640.00	31.09	AV	H	13.19	44.28	54	-9.72
10640.00	45.52	PK	V	13.19	58.71	74	-15.29
10640.00	30.87	AV	V	13.19	44.06	54	-9.94

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n40							
5270MHz							
5015.96	54.94	PK	H	2.97	57.91	74	-16.09
5015.96	41.39	AV	H	2.97	44.36	54	-9.64
5087.25	54.75	PK	V	3.07	57.82	74	-16.18
5087.25	41.23	AV	V	3.07	44.30	54	-9.70
10540.00	44.93	PK	H	13.03	57.96	68.2	-10.24
10540.00	44.79	PK	V	13.03	57.82	68.2	-10.38
5310MHz							
5451.87	55.56	PK	H	3.59	59.15	74	-14.85
5451.87	41.09	AV	H	3.59	44.68	54	-9.32
5445.91	55.27	PK	V	3.27	58.54	74	-15.46
5445.91	40.85	AV	V	3.27	44.12	54	-9.88
10620.00	45.47	PK	H	13.09	58.56	74	-15.44
10620.00	31.56	AV	H	13.09	44.65	54	-9.35
10620.00	45.24	PK	V	13.09	58.33	74	-15.67
10620.00	31.32	AV	V	13.09	44.41	54	-9.59

5470-5725MHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11a							
5500MHz							
5466.53	55.72	PK	H	3.59	59.31	68.2	-8.89
5460.99	55.57	PK	V	3.59	59.16	68.2	-9.04
11000.00	45.12	PK	H	13.98	59.10	74	-14.90
11000.00	29.93	AV	H	13.98	43.91	54	-10.09
11000.00	44.85	PK	V	13.98	58.83	74	-15.17
11000.00	29.68	AV	V	13.98	43.66	54	-10.34
5580MHz							
11160.00	45.37	PK	H	13.62	58.99	74	-15.01
11160.00	30.25	AV	H	13.62	43.87	54	-10.13
11160.00	45.14	PK	V	13.62	58.76	74	-15.24
11160.00	30.03	AV	V	13.62	43.65	54	-10.35
5700MHz							
5741.87	55.25	PK	H	4.19	59.44	68.2	-8.76
5736.48	55.06	PK	V	4.19	59.25	68.2	-8.95
11400.00	45.69	PK	H	14.08	59.77	74	-14.23
11400.00	30.78	AV	H	14.08	44.86	54	-9.14
11400.00	45.46	PK	V	14.08	59.54	74	-14.46
11400.00	30.57	AV	V	14.08	44.65	54	-9.35

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n20							
5500MHz							
5461.87	55.99	PK	H	3.59	59.58	68.2	-8.62
5469.06	55.74	PK	V	3.69	59.43	68.2	-8.77
11000.00	45.09	PK	H	13.98	59.07	74	-14.93
11000.00	30.18	AV	H	13.98	44.16	54	-9.84
11000.00	44.83	PK	V	13.98	58.81	74	-15.19
11000.00	29.96	AV	V	13.98	43.94	54	-10.06
5580MHz							
11160.00	45.45	PK	H	13.62	59.07	74	-14.93
11160.00	30.51	AV	H	13.62	44.13	54	-9.87
11160.00	45.23	PK	V	13.62	58.85	74	-15.15
11160.00	30.32	AV	V	13.62	43.94	54	-10.06
5700MHz							
5733.50	55.64	PK	H	4.19	59.83	68.2	-8.37
5742.68	55.39	PK	V	4.19	59.58	68.2	-8.62
11400.00	45.78	PK	H	14.08	59.86	74	-14.14
11400.00	30.85	AV	H	14.08	44.93	54	-9.07
11400.00	45.54	PK	V	14.08	59.62	74	-14.38
11400.00	30.63	AV	V	14.08	44.71	54	-9.29

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n40							
5510MHz							
5465.51	55.89	PK	H	3.59	59.48	68.2	-8.72
5462.83	55.66	PK	V	3.59	59.25	68.2	-8.95
11020.00	44.67	PK	H	13.89	58.56	74	-15.44
11020.00	29.59	AV	H	13.89	43.48	54	-10.52
11020.00	44.45	PK	V	13.89	58.34	74	-15.66
11020.00	29.38	AV	V	13.89	43.27	54	-10.73
5550MHz							
11100.00	45.08	PK	H	13.53	58.61	74	-15.39
11100.00	30.17	AV	H	13.53	43.70	54	-10.30
11100.00	44.89	PK	V	13.53	58.42	74	-15.58
11100.00	29.94	AV	V	13.53	43.47	54	-10.53
5670MHz							
5727.32	55.57	PK	H	4.09	59.66	68.2	-8.54
5725.79	55.38	PK	V	4.09	59.47	68.2	-8.73
11340.00	45.46	PK	H	13.99	59.45	74	-14.55
11340.00	30.72	AV	H	13.99	44.71	54	-9.29
11340.00	45.24	PK	V	13.99	59.23	74	-14.77
11340.00	30.49	AV	V	13.99	44.48	54	-9.52

5725-5850 MHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11a							
5745MHz							
5621.14	55.42	PK	H	3.59	59.01	68.20	-9.19
5651.45	55.93	PK	H	3.59	59.52	105.20	-45.68
5715.39	56.57	PK	H	4.09	60.66	110.80	-50.14
5724.68	57.86	PK	H	4.09	61.95	122.20	-60.25
5625.38	55.25	PK	V	3.59	58.84	68.20	-9.36
5678.49	55.64	PK	V	3.69	59.33	105.20	-45.87
5714.52	56.12	PK	V	4.09	60.21	110.80	-50.59
5723.61	57.09	PK	V	4.09	61.18	122.20	-61.02
11490.00	45.15	PK	H	14.31	59.46	74	-14.54
11490.00	29.87	AV	H	14.31	44.18	54	-9.82
11490.00	44.91	PK	V	14.31	59.22	74	-14.78
11490.00	29.64	AV	V	14.31	43.95	54	-10.05
5785MHz							
11570.00	45.46	PK	H	14.05	59.51	74	-14.49
11570.00	30.19	AV	H	14.05	44.24	54	-9.76
11570.00	45.23	PK	V	14.05	59.28	74	-14.72
11570.00	29.95	AV	V	14.05	44.00	54	-10.00
5825MHz							
5852.75	57.54	PK	H	4.09	61.63	122.20	-60.57
5874.56	56.78	PK	H	4.19	60.97	110.80	-49.83
5887.84	55.89	PK	H	4.19	60.08	105.20	-45.12
5945.17	55.13	PK	H	4.69	59.82	68.20	-8.38
5851.69	57.05	PK	V	4.09	61.14	122.20	-61.06
5869.72	56.32	PK	V	4.19	60.51	110.80	-50.29
5904.36	55.57	PK	V	4.59	60.16	105.20	-45.04
5928.54	54.96	PK	V	4.69	59.65	68.20	-8.55
11650.00	45.86	PK	H	13.83	59.69	74	-14.31
11650.00	30.48	AV	H	13.83	44.31	54	-9.69
11650.00	45.63	PK	V	13.83	59.46	74	-14.54
11650.00	30.25	AV	V	13.83	44.08	54	-9.92

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n20							
5745MHz							
5649.38	55.75	PK	H	3.59	59.34	68.20	-8.86
5698.69	56.32	PK	H	3.79	60.11	105.20	-45.09
5717.45	57.27	PK	H	4.09	61.36	110.80	-49.44
5724.72	58.48	PK	H	4.09	62.57	122.20	-59.63
5648.97	55.51	PK	V	3.59	59.10	68.20	-9.10
5689.24	56.04	PK	V	3.69	59.73	105.20	-45.47
5715.86	56.89	PK	V	4.09	60.98	110.80	-49.82
5723.65	57.93	PK	V	4.09	62.02	122.20	-60.18
11490.00	45.02	PK	H	14.31	59.33	74	-14.67
11490.00	29.97	AV	H	14.31	44.28	54	-9.72
11490.00	44.78	PK	V	14.31	59.09	74	-14.91
11490.00	29.74	AV	V	14.31	44.05	54	-9.95
5785MHz							
11570.00	45.36	PK	H	14.05	59.41	74	-14.59
11570.00	30.29	AV	H	14.05	44.34	54	-9.66
11570.00	45.13	PK	V	14.05	59.18	74	-14.82
11570.00	30.05	AV	V	14.05	44.10	54	-9.90
5825MHz							
5850.78	57.95	PK	H	4.09	62.04	122.20	-60.16
5857.94	57.08	PK	H	4.09	61.17	110.80	-49.63
5878.19	56.24	PK	H	4.19	60.43	105.20	-44.77
5925.83	55.39	PK	H	4.69	60.08	68.20	-8.12
5851.68	57.42	PK	V	4.09	61.51	122.20	-60.69
5855.96	56.78	PK	V	4.09	60.87	110.80	-49.93
5876.25	55.89	PK	V	4.19	60.08	105.20	-45.12
5927.31	55.14	PK	V	4.69	59.83	68.20	-8.37
11650.00	45.68	PK	H	13.83	59.51	74	-14.49
11650.00	30.52	AV	H	13.83	44.35	54	-9.65
11650.00	45.45	PK	V	13.83	59.28	74	-14.72
11650.00	30.31	AV	V	13.83	44.14	54	-9.86

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n40							
5755MHz							
5620.41	55.94	PK	H	3.59	59.53	68.20	-8.67
5657.27	56.78	PK	H	3.59	60.37	105.20	-44.83
5714.08	57.85	PK	H	4.09	61.94	110.80	-48.86
5724.83	58.69	PK	H	4.09	62.78	122.20	-59.42
5624.36	55.72	PK	V	3.59	59.31	68.20	-8.89
5655.64	56.25	PK	V	3.59	59.84	105.20	-45.36
5717.48	57.18	PK	V	4.09	61.27	110.80	-49.53
5721.95	58.01	PK	V	4.09	62.10	122.20	-60.10
11510.00	45.29	PK	H	14.29	59.58	74	-14.42
11510.00	30.35	AV	H	14.29	44.64	54	-9.36
11510.00	45.06	PK	V	14.29	59.35	74	-14.65
11510.00	30.14	AV	V	14.29	44.43	54	-9.57
5795MHz							
5852.25	58.27	PK	H	4.09	62.36	122.20	-59.84
5856.84	57.62	PK	H	4.09	61.71	110.80	-49.09
5878.39	56.88	PK	H	4.19	61.07	105.20	-44.13
5925.73	55.54	PK	H	4.69	60.23	68.20	-7.97
5851.51	57.86	PK	V	4.09	61.95	122.20	-60.25
5855.94	57.13	PK	V	4.09	61.22	110.80	-49.58
5882.36	56.24	PK	V	4.19	60.43	105.20	-44.77
5927.68	55.35	PK	V	4.69	60.04	68.20	-8.16
11590.00	45.78	PK	H	13.97	59.75	74	-14.25
11590.00	30.69	AV	H	13.97	44.66	54	-9.34
11590.00	45.54	PK	V	13.97	59.51	74	-14.49
11590.00	30.47	AV	V	13.97	44.44	54	-9.56

Note:

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

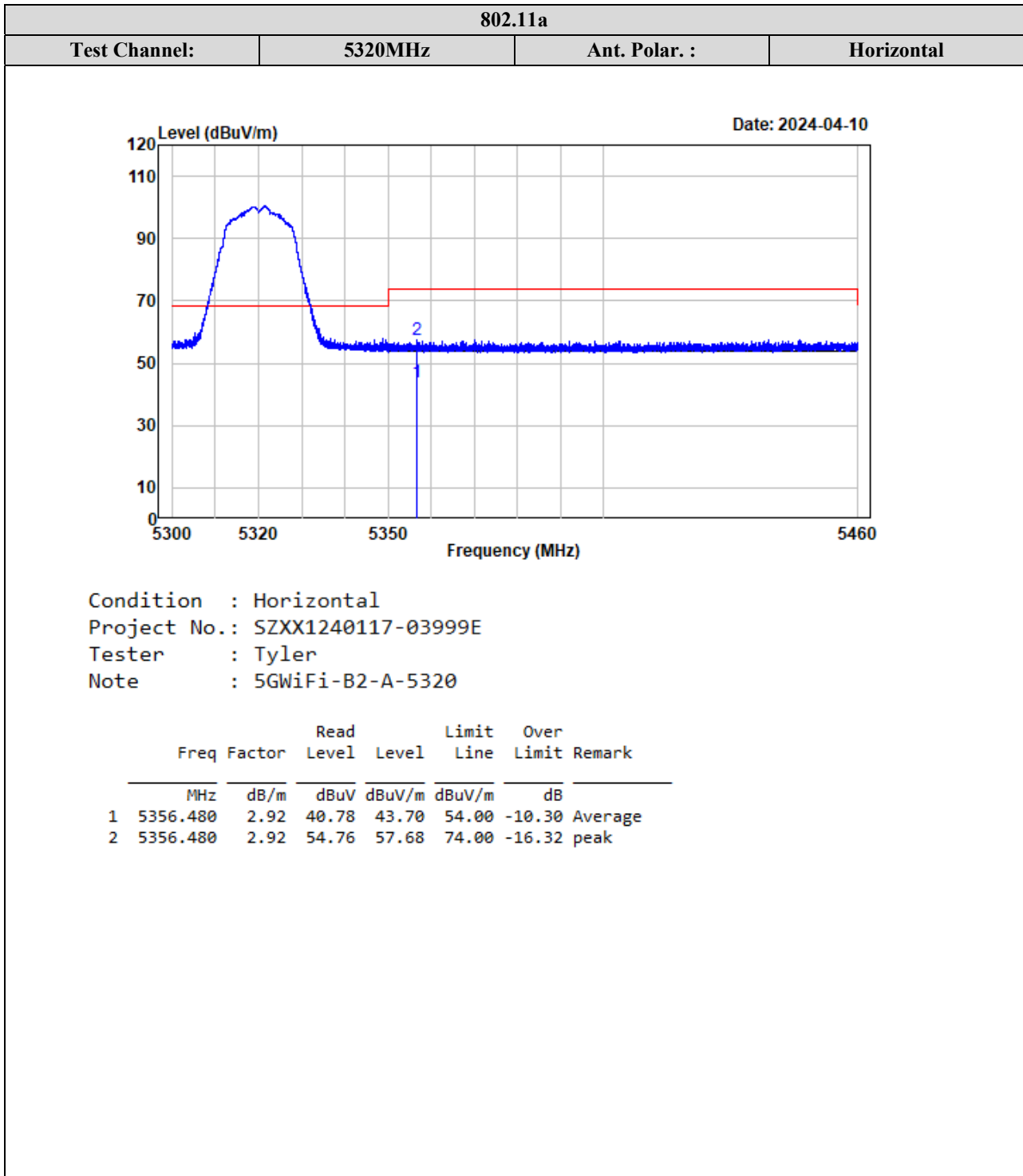
Corrected Amplitude = Factor + Reading

Margin = Corrected. Amplitude - Limit

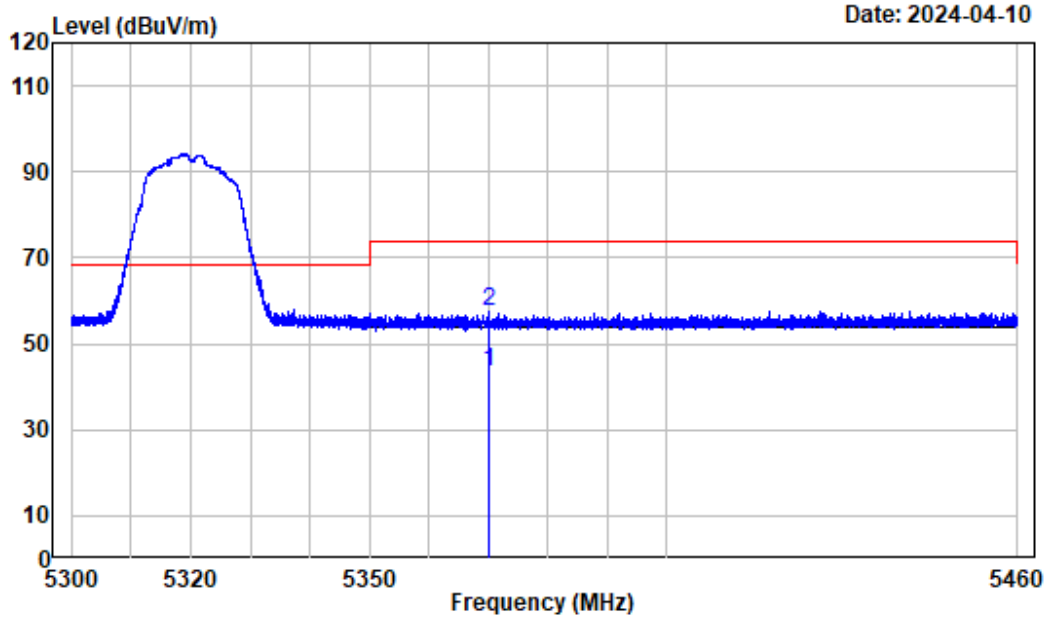
The other spurious emission which is in the noise floor level was not recorded.

Test plots for Band Edge Measurements (Radiated)

5250-5350MHz:



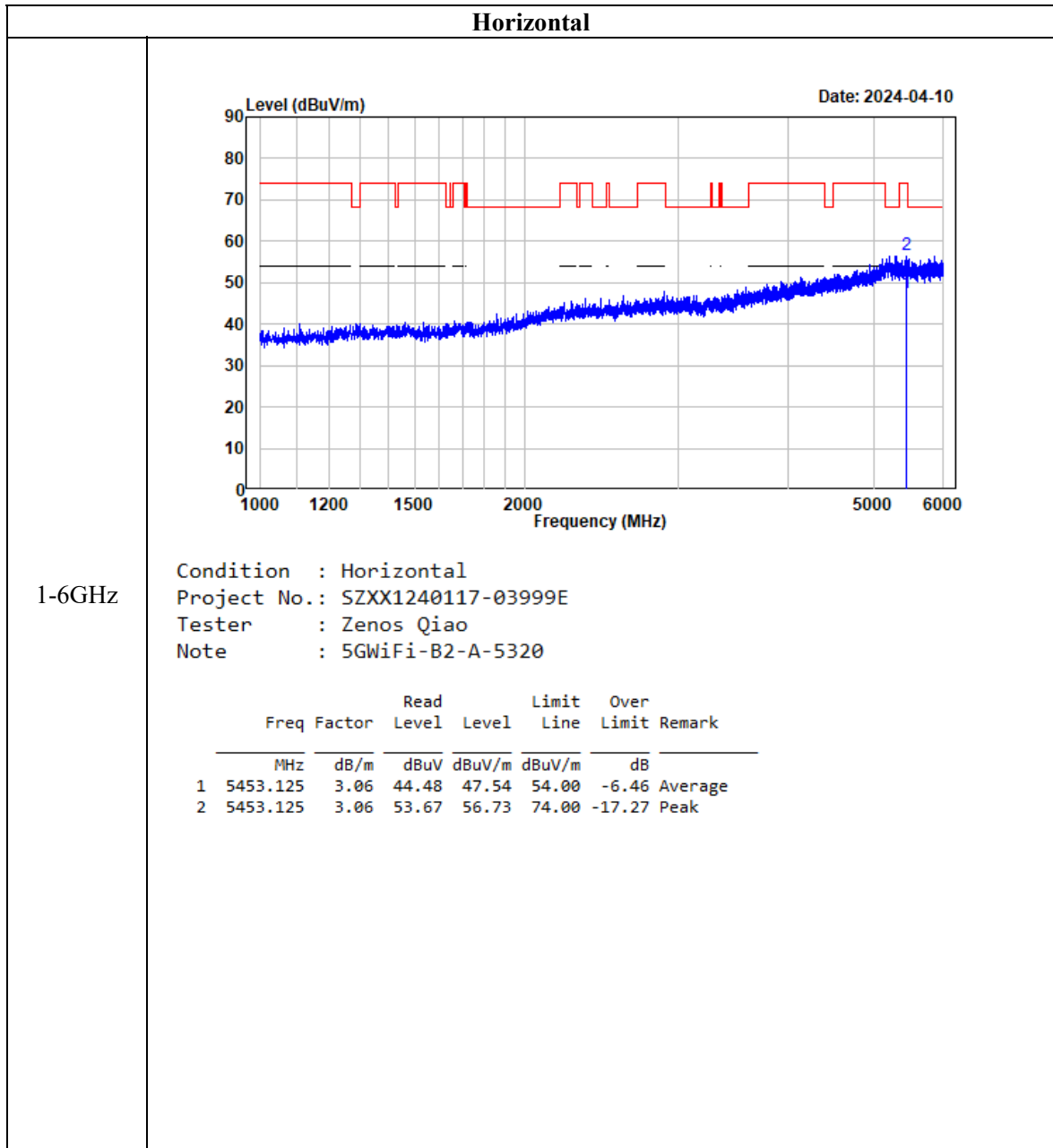
802.11a			
Test Channel:	5320MHz	Ant. Polar. :	Vertical



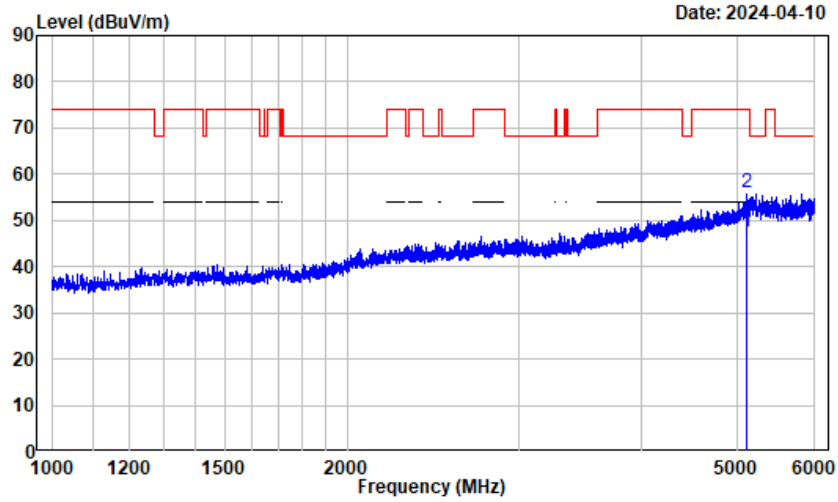
Condition : Vertical
 Project No.: SZXX1240117-03999E
 Tester : Tyler
 Note : 5WiFi-B2-A-5320

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5370.000	2.94	40.38	43.32	54.00	-10.68	Average
2	5370.000	2.94	54.42	57.36	74.00	-16.64	peak

Listed with the worst harmonic margin test plot (802.11a, 5320MHz)



Vertical

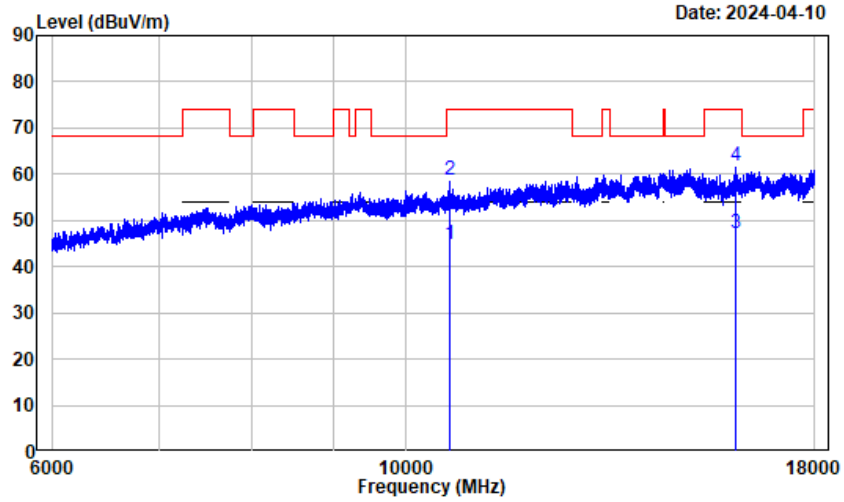


1-6GHz

Condition : Vertical
 Project No.: SZXX1240117-03999E
 Tester : Zenos Qiao
 Note : 5GWiFi-B2-A-5320

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5115.000	2.71	44.68	47.39	54.00	-6.61	Average
2	5115.000	2.71	53.27	55.98	74.00	-18.02	Peak

Horizontal

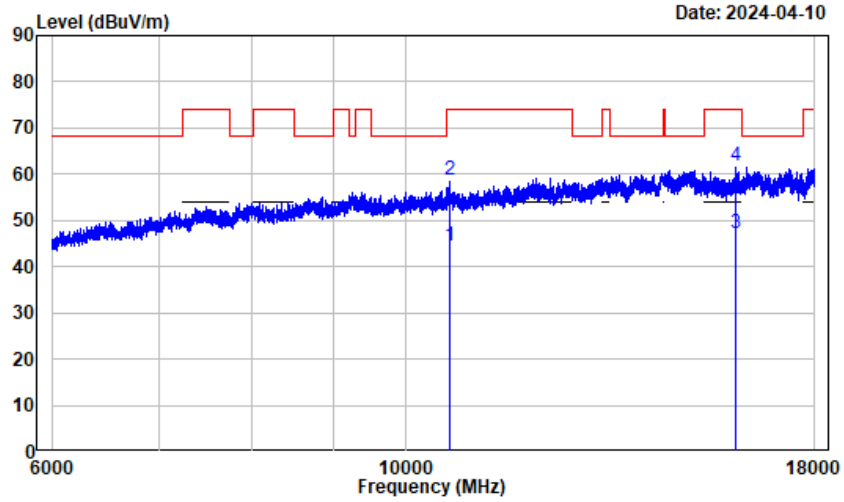


6-18GHz

Condition : Horizontal
 Project No.: SZXX1240117-03999E
 Tester : Zenos Qiao
 Note : 5GWiFi-B2-A-5320

Freq	Factor	Read		Limit	Over	Remark
		Level	Level			
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	10640.000	13.19	31.68	44.87	54.00	-9.13 Average
2	10640.000	13.19	45.71	58.90	74.00	-15.10 Peak
3	16062.000	13.77	33.58	47.35	54.00	-6.65 Average
4	16062.000	13.77	48.08	61.85	74.00	-12.15 Peak

Vertical

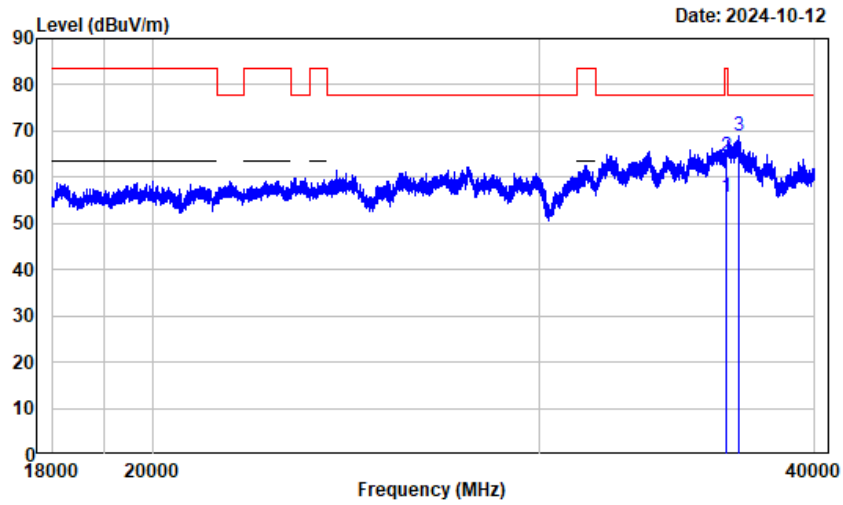


6-18GHz

Condition : Vertical
 Project No.: SZXX1240117-03999E
 Tester : Zenos Qiao
 Note : 5GWiFi-B2-A-5320

Freq	Factor	Read		Limit	Over	Remark
		Level	Level			
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	10640.000	13.19	31.25	44.44	54.00	-9.56 Average
2	10640.000	13.19	45.67	58.86	74.00	-15.14 Peak
3	16053.000	13.74	33.55	47.29	54.00	-6.71 Average
4	16053.000	13.74	48.22	61.96	74.00	-12.04 Peak

Horizontal

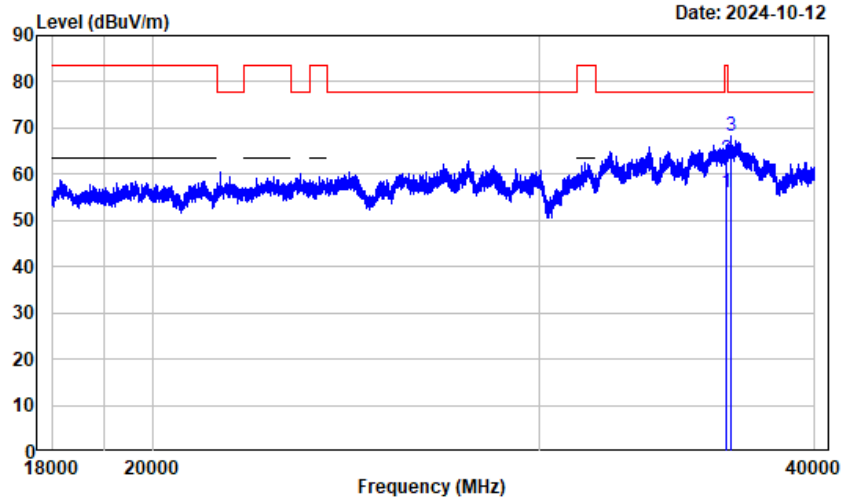


18-40GHz

Condition : Horizontal
 Project No.: SZXX1240117-03999E
 Tester : Zenos Qiao
 Note : 5GWiFi-B2-A-5320

	Read	Limit	Over				
Freq	Factor	Level	Level	Line			
MHz	dB/m	dBuV	dBuV/m	dBuV/m			
1	36485.500	25.34	30.42	55.76	63.50	-7.74	Average
2	36485.500	25.34	39.04	64.38	83.50	-19.12	Peak
3	36961.250	24.94	44.16	69.10	77.70	-8.60	Peak

Vertical



18-40GHz

Condition : Vertical
 Project No.: SZXX1240117-03999E
 Tester : Zenos Qiao
 Note : 5GWiFi-B2-A-5320

	Read	Limit	Over				
Freq	Factor	Level	Level	Line			
MHz	dB/m	dBuV	dBuV/m	dBuV/m			
1	36469.000	25.29	30.84	56.13	63.50	-7.37	Average
2	36469.000	25.29	37.99	63.28	83.50	-20.22	Peak
3	36647.750	25.24	42.95	68.19	77.70	-9.51	Peak

ANT2

Above 1GHz:

5250-5350MHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11a							
5260MHz							
5042.75	55.31	PK	H	2.97	58.28	74	-15.72
5042.75	40.84	AV	H	2.97	43.81	54	-10.19
5043.54	55.12	PK	V	2.97	58.09	74	-15.91
5043.54	40.69	AV	V	2.97	43.66	54	-10.34
10520.00	45.39	PK	H	13.05	58.44	68.2	-9.76
10520.00	45.21	PK	V	13.05	58.26	68.2	-9.94
5280MHz							
10560.00	45.84	PK	H	13.02	58.86	68.2	-9.34
10560.00	45.65	PK	V	13.02	58.67	68.2	-9.53
5320MHz							
5351.99	55.45	PK	H	2.91	58.36	74	-15.64
5351.99	40.73	AV	H	2.91	43.64	54	-10.36
5350.86	55.09	PK	V	2.90	57.99	74	-16.01
5350.86	40.48	AV	V	2.90	43.38	54	-10.62
10640.00	46.27	PK	H	13.19	59.46	74	-14.54
10640.00	31.75	AV	H	13.19	44.94	54	-9.06
10640.00	46.12	PK	V	13.19	59.31	74	-14.69
10640.00	31.68	AV	V	13.19	44.87	54	-9.13

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n20							
5260MHz							
5047.87	55.19	PK	H	2.97	58.16	74	-15.84
5047.87	40.86	AV	H	2.97	43.83	54	-10.17
5045.68	55.04	PK	V	2.97	58.01	74	-15.99
5045.68	40.72	AV	V	2.97	43.69	54	-10.31
10520.00	45.25	PK	H	13.05	58.30	68.2	-9.90
10520.00	45.03	PK	V	13.05	58.08	68.2	-10.12
5280MHz							
10560.00	45.68	PK	H	13.02	58.70	68.2	-9.50
10560.00	45.45	PK	V	13.02	58.47	68.2	-9.73
5320MHz							
5350.95	55.38	PK	H	2.90	58.28	74	-15.72
5350.95	40.69	AV	H	2.90	43.59	54	-10.41
5350.24	55.12	PK	V	2.90	58.02	74	-15.98
5350.24	40.51	AV	V	2.90	43.41	54	-10.59
10640.00	46.12	PK	H	13.19	59.31	74	-14.69
10640.00	31.77	AV	H	13.19	44.96	54	-9.04
10640.00	45.91	PK	V	13.19	59.10	74	-14.90
10640.00	31.65	AV	V	13.19	44.84	54	-9.16

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
	Reading (dB μ V)	PK/Ave					
802.11n40							
5270MHz							
5057.42	55.03	PK	H	2.97	58.00	74	-16.00
5057.42	40.86	AV	H	2.97	43.83	54	-10.17
5059.15	54.71	PK	V	2.97	57.68	74	-16.32
5059.15	40.69	AV	V	2.97	43.66	54	-10.34
10540.00	45.64	PK	H	13.03	58.67	68.2	-9.53
10540.00	45.41	PK	V	13.03	58.44	68.2	-9.76
5310MHz							
5350.88	55.89	PK	H	2.90	58.79	74	-15.21
5350.88	40.96	AV	H	2.90	43.86	54	-10.14
5350.40	55.54	PK	V	2.90	58.44	74	-15.56
5350.40	40.75	AV	V	2.90	43.65	54	-10.35
10620.00	45.93	PK	H	13.09	59.02	74	-14.98
10620.00	31.70	AV	H	13.09	44.79	54	-9.21
10620.00	45.68	PK	V	13.09	58.77	74	-15.23
10620.00	31.54	AV	V	13.09	44.63	54	-9.37

5470-5725MHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11a							
5500MHz							
5460.00	54.57	PK	H	3.59	58.16	74	-15.84
5460.00	40.48	AV	H	3.59	44.07	54	-9.93
5460.00	54.36	PK	V	3.59	57.95	74	-16.05
5460.00	40.29	AV	V	3.59	43.88	54	-10.12
5467.89	55.83	PK	H	3.59	59.42	68.2	-8.78
5468.12	55.55	PK	V	3.59	59.14	68.2	-9.06
11000.00	44.91	PK	H	13.98	58.89	74	-15.11
11000.00	30.18	AV	H	13.98	44.16	54	-9.84
11000.00	44.74	PK	V	13.98	58.72	74	-15.28
11000.00	30.03	AV	V	13.98	44.01	54	-9.99
5580MHz							
11160.00	45.27	PK	H	13.62	58.89	74	-15.11
11160.00	30.70	AV	H	13.62	44.32	54	-9.68
11160.00	45.09	PK	V	13.62	58.71	74	-15.29
11160.00	30.54	AV	V	13.62	44.16	54	-9.84
5700MHz							
5725.78	55.33	PK	H	4.09	59.42	68.2	-8.78
5726.25	55.08	PK	V	4.09	59.17	68.2	-9.03
11400.00	45.69	PK	H	14.08	59.77	74	-14.23
11400.00	31.23	AV	H	14.08	45.31	54	-8.69
11400.00	45.56	PK	V	14.08	59.64	74	-14.36
11400.00	31.05	AV	V	14.08	45.13	54	-8.87

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n20							
5500MHz							
5460.00	54.86	PK	H	3.59	58.45	74	-15.55
5460.00	40.59	AV	H	3.59	44.18	54	-9.82
5460.00	54.64	PK	V	3.59	58.23	74	-15.77
5460.00	40.35	AV	V	3.59	43.94	54	-10.06
5467.45	56.19	PK	H	3.59	59.78	68.2	-8.42
5769.08	55.92	PK	V	4.19	60.11	68.2	-8.09
11000.00	45.11	PK	H	13.98	59.09	74	-14.91
11000.00	30.27	AV	H	13.98	44.25	54	-9.75
11000.00	44.92	PK	V	13.98	58.90	74	-15.10
11000.00	30.09	AV	V	13.98	44.07	54	-9.93
5580MHz							
11160.00	45.43	PK	H	13.62	59.05	74	-14.95
11160.00	30.78	AV	H	13.62	44.40	54	-9.60
11160.00	45.25	PK	V	13.62	58.87	74	-15.13
11160.00	30.61	AV	V	13.62	44.23	54	-9.77
5700MHz							
5725.96	55.19	PK	H	4.09	59.28	68.2	-8.92
5727.39	55.02	PK	V	4.09	59.11	68.2	-9.09
11400.00	45.75	PK	H	14.08	59.83	74	-14.17
11400.00	31.30	AV	H	14.08	45.38	54	-8.62
11400.00	45.53	PK	V	14.08	59.61	74	-14.39
11400.00	31.14	AV	V	14.08	45.22	54	-8.78

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n40							
5510MHz							
5460.00	54.64	PK	H	3.59	58.23	74	-15.77
5460.00	40.58	AV	H	3.59	44.17	54	-9.83
5460.00	54.41	PK	V	3.59	58.00	74	-16.00
5460.00	40.39	AV	V	3.59	43.98	54	-10.02
5468.18	55.87	PK	H	3.59	59.46	68.2	-8.74
5467.87	55.56	PK	V	3.59	59.15	68.2	-9.05
11020.00	44.64	PK	H	13.89	58.53	74	-15.47
11020.00	30.16	AV	H	13.89	44.05	54	-9.95
11020.00	44.45	PK	V	13.89	58.34	74	-15.66
11020.00	30.01	AV	V	13.89	43.90	54	-10.10
5550MHz							
11100.00	44.98	PK	H	13.53	58.51	74	-15.49
11100.00	30.47	AV	H	13.53	44.00	54	-10.00
11100.00	44.79	PK	V	13.53	58.32	74	-15.68
11100.00	30.30	AV	V	13.53	43.83	54	-10.17
5670MHz							
5725.35	55.55	PK	H	4.09	59.64	68.2	-8.56
5725.56	55.32	PK	V	4.09	59.41	68.2	-8.79
11340.00	45.32	PK	H	13.99	59.31	74	-14.69
11340.00	30.89	AV	H	13.99	44.88	54	-9.12
11340.00	45.07	PK	V	13.99	59.06	74	-14.94
11340.00	30.72	AV	V	13.99	44.71	54	-9.29

5725-5850 MHz:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11a							
5745MHz							
5650.00	55.39	PK	H	3.59	58.98	68.20	-9.22
5700.00	56.16	PK	H	4.09	60.25	105.20	-44.95
5720.00	57.08	PK	H	4.09	61.17	110.80	-49.63
5725.00	58.32	PK	H	4.09	62.41	122.20	-59.79
5650.00	55.17	PK	V	3.59	58.76	68.20	-9.44
5700.00	55.64	PK	V	4.09	59.73	105.20	-45.47
5720.00	56.53	PK	V	4.09	60.62	110.80	-50.18
5725.00	57.71	PK	V	4.09	61.80	122.20	-60.40
11490.00	44.84	PK	H	14.31	59.15	74	-14.85
11490.00	30.19	AV	H	14.31	44.50	54	-9.50
11490.00	44.65	PK	V	14.31	58.96	74	-15.04
11490.00	30.03	AV	V	14.31	44.34	54	-9.66
5785MHz							
11570.00	45.05	PK	H	14.05	59.10	74	-14.90
11570.00	30.71	AV	H	14.05	44.76	54	-9.24
11570.00	44.86	PK	V	14.05	58.91	74	-15.09
11570.00	30.54	AV	V	14.05	44.59	54	-9.41
5825MHz							
5850.00	57.78	PK	H	4.09	61.87	122.20	-60.33
5855.00	56.89	PK	H	4.09	60.98	110.80	-49.82
5875.00	56.07	PK	H	4.19	60.26	105.20	-44.94
5925.00	55.25	PK	H	4.69	59.94	68.20	-8.26
5850.00	57.19	PK	V	4.09	61.28	122.20	-60.92
5855.00	56.23	PK	V	4.09	60.32	110.80	-50.48
5875.00	55.64	PK	V	4.19	59.83	105.20	-45.37
5925.00	55.06	PK	V	4.69	59.75	68.20	-8.45
11650.00	45.38	PK	H	13.83	59.21	74	-14.79
11650.00	31.26	AV	H	13.83	45.09	54	-8.91
11650.00	45.17	PK	V	13.83	59.00	74	-15.00
11650.00	31.09	AV	V	13.83	44.92	54	-9.08

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n20							
5745MHz							
5650.00	55.79	PK	H	3.59	59.38	68.20	-8.82
5700.00	56.56	PK	H	4.09	60.65	105.20	-44.55
5720.00	57.48	PK	H	4.09	61.57	110.80	-49.23
5725.00	58.90	PK	H	4.09	62.99	122.20	-59.21
5650.00	55.54	PK	V	3.59	59.13	68.20	-9.07
5700.00	56.12	PK	V	4.09	60.21	105.20	-44.99
5720.00	57.03	PK	V	4.09	61.12	110.80	-49.68
5725.00	58.21	PK	V	4.09	62.30	122.20	-59.90
11490.00	44.69	PK	H	14.31	59.00	74	-15.00
11490.00	30.15	AV	H	14.31	44.46	54	-9.54
11490.00	44.48	PK	V	14.31	58.79	74	-15.21
11490.00	30.00	AV	V	14.31	44.31	54	-9.69
5785MHz							
11570.00	45.07	PK	H	14.05	59.12	74	-14.88
11570.00	30.76	AV	H	14.05	44.81	54	-9.19
11570.00	44.91	PK	V	14.05	58.96	74	-15.04
11570.00	30.62	AV	V	14.05	44.67	54	-9.33
5825MHz							
5850.00	58.45	PK	H	4.09	62.54	122.20	-59.66
5855.00	57.64	PK	H	4.09	61.73	110.80	-49.07
5875.00	56.72	PK	H	4.19	60.91	105.20	-44.29
5925.00	55.51	PK	H	4.69	60.20	68.20	-8.00
5850.00	57.89	PK	V	4.09	61.98	122.20	-60.22
5855.00	57.06	PK	V	4.09	61.15	110.80	-49.65
5875.00	56.25	PK	V	4.19	60.44	105.20	-44.76
5925.00	55.32	PK	V	4.69	60.01	68.20	-8.19
11650.00	45.44	PK	H	13.83	59.27	74	-14.73
11650.00	31.31	AV	H	13.83	45.14	54	-8.86
11650.00	45.26	PK	V	13.83	59.09	74	-14.91
11650.00	31.13	AV	V	13.83	44.96	54	-9.04

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	PK/Ave					
802.11n40							
5755MHz							
5650.00	56.16	PK	H	3.59	59.75	68.20	-8.45
5700.00	57.25	PK	H	4.09	61.34	105.20	-43.86
5720.00	58.47	PK	H	4.09	62.56	110.80	-48.24
5725.00	59.39	PK	H	4.09	63.48	122.20	-58.72
5650.00	55.94	PK	V	3.59	59.53	68.20	-8.67
5700.00	56.83	PK	V	4.09	60.92	105.20	-44.28
5720.00	57.86	PK	V	4.09	61.95	110.80	-48.85
5725.00	58.72	PK	V	4.09	62.81	122.20	-59.39
11510.00	45.14	PK	H	14.29	59.43	74	-14.57
11510.00	30.49	AV	H	14.29	44.78	54	-9.22
11510.00	44.93	PK	V	14.29	59.22	74	-14.78
11510.00	30.32	AV	V	14.29	44.61	54	-9.39
5795MHz							
5850.00	58.89	PK	H	4.09	62.98	122.20	-59.22
5855.00	57.93	PK	H	4.09	62.02	110.80	-48.78
5875.00	57.12	PK	H	4.19	61.31	105.20	-43.89
5925.00	55.85	PK	H	4.69	60.54	68.20	-7.66
5850.00	58.17	PK	V	4.09	62.26	122.20	-59.94
5855.00	57.08	PK	V	4.09	61.17	110.80	-49.63
5875.00	56.51	PK	V	4.19	60.70	105.20	-44.50
5925.00	55.63	PK	V	4.69	60.32	68.20	-7.88
11590.00	45.68	PK	H	13.97	59.65	74	-14.35
11590.00	31.05	AV	H	13.97	45.02	54	-8.98
11590.00	45.46	PK	V	13.97	59.43	74	-14.57
11590.00	30.89	AV	V	13.97	44.86	54	-9.14

Note:

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

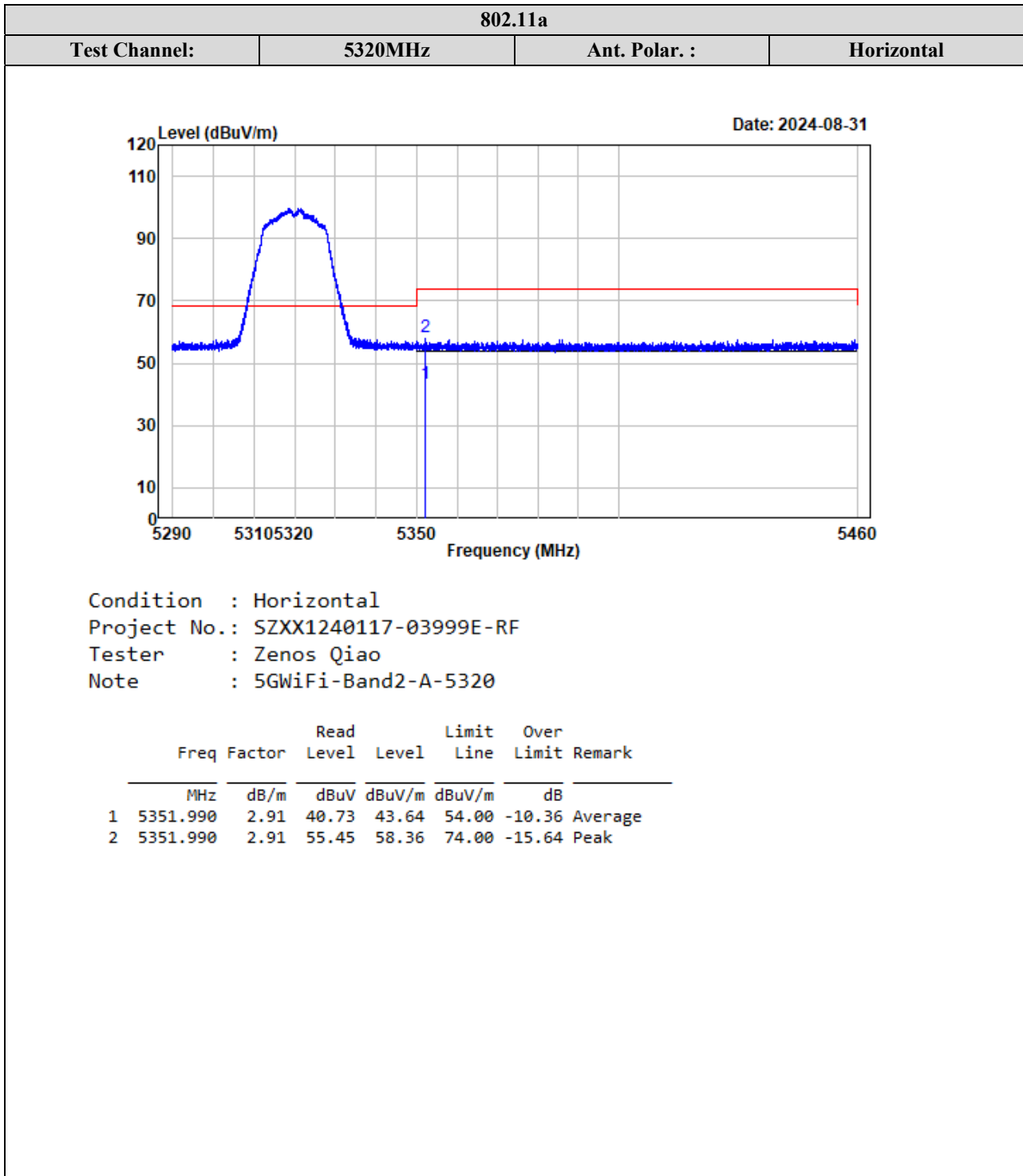
Corrected Amplitude = Factor + Reading

Margin = Corrected. Amplitude - Limit

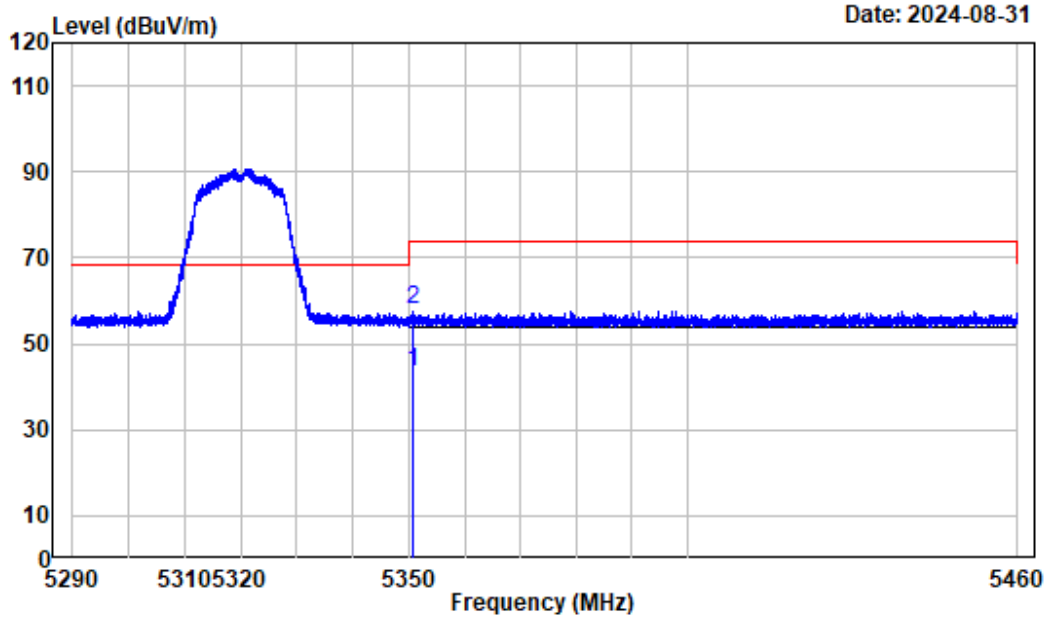
The other spurious emission which is in the noise floor level was not recorded.

Test plots for Band Edge Measurements (Radiated)

5250-5350MHz:



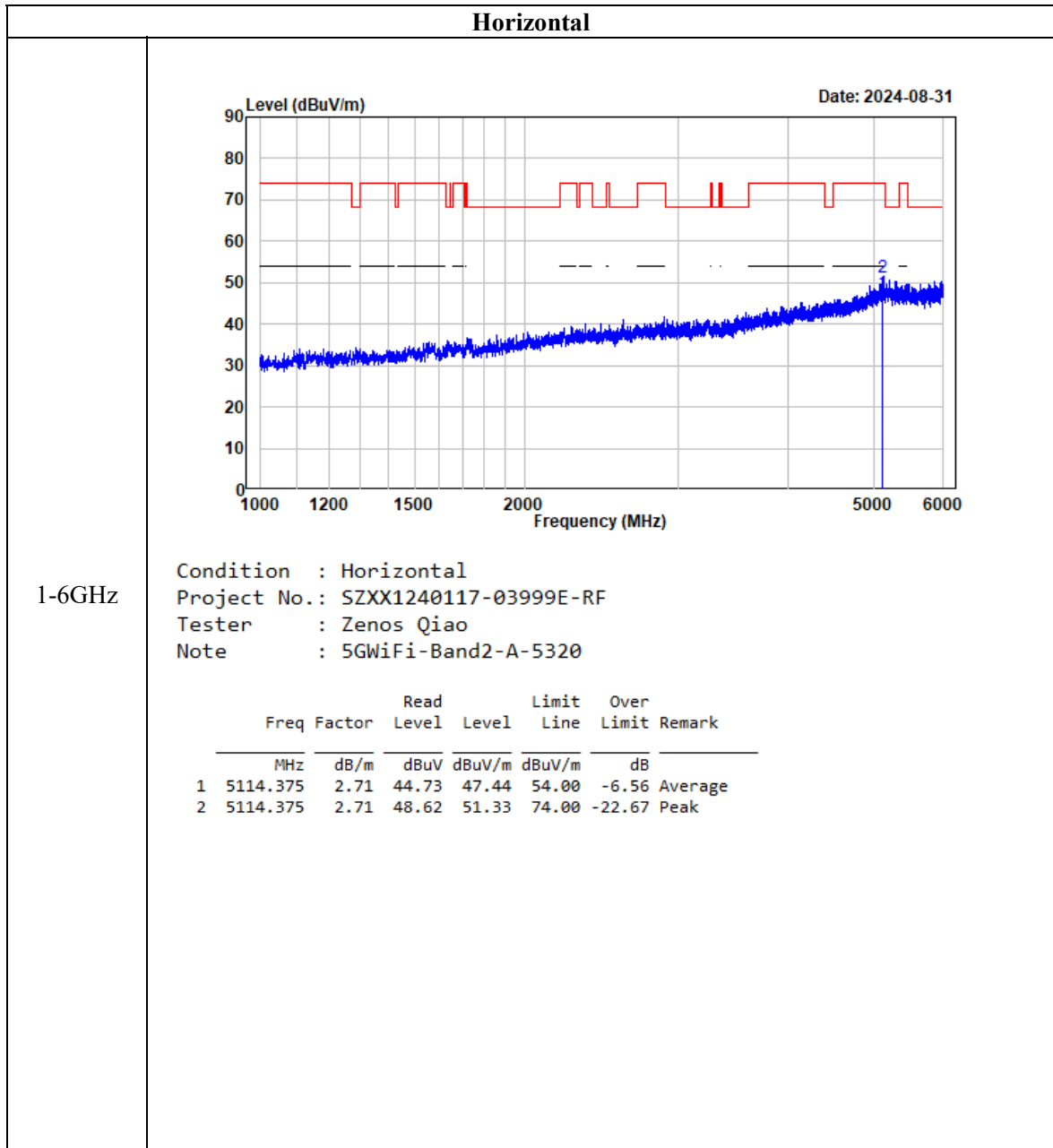
802.11a			
Test Channel:	5320MHz	Ant. Polar. :	Vertical



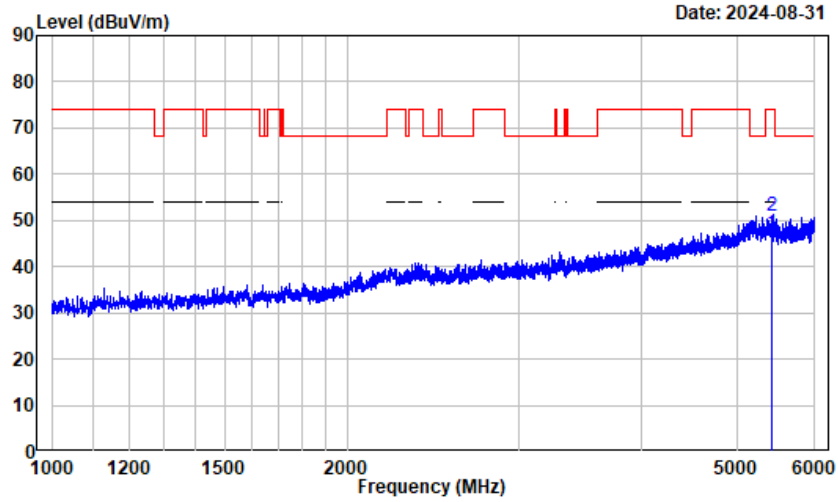
Condition : Vertical
 Project No.: SZXX1240117-03999E-RF
 Tester : Zenos Qiao
 Note : 5GWiFi-Band2-A-5320

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5350.860	2.90	40.48	43.38	54.00	-10.62	Average
2	5350.860	2.90	55.09	57.99	74.00	-16.01	Peak

Listed with the worst harmonic margin test plot (802.11a, 5320MHz)



Vertical

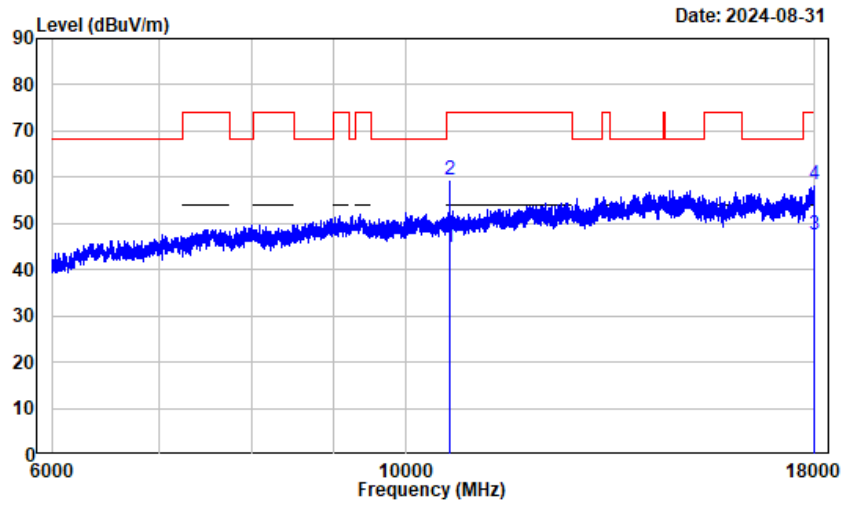


1-6GHz

Condition : Vertical
 Project No.: SZXX1240117-03999E-RF
 Tester : Zenos Qiao
 Note : 5GWiFi-Band2-A-5320

	Freq	Factor	Read Level	Read Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	5421.250	3.02	44.30	47.32	54.00	-6.68	Average
2	5421.250	3.02	48.08	51.10	74.00	-22.90	Peak

Horizontal

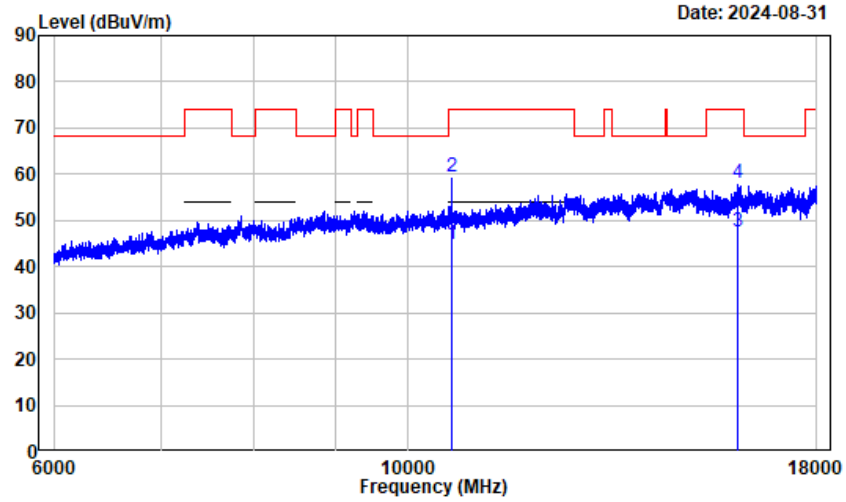


6-18GHz

Condition : Horizontal
 Project No.: SZXX1240117-03999E-RF
 Tester : Zenos Qiao
 Note : 5GWiFi-Band2-A-5320

	Read	Limit	Over				
Freq	Factor	Level	Level	Line			
MHz	dB/m	dBuV	dBuV/m	dBuV/m			
1	10640.000	13.19	31.75	44.94	54.00	-9.06	Average
2	10640.000	13.19	46.27	59.46	74.00	-14.54	Peak
3	17989.500	24.55	23.14	47.69	54.00	-6.31	Average
4	17989.500	24.55	33.73	58.28	74.00	-15.72	Peak

Vertical

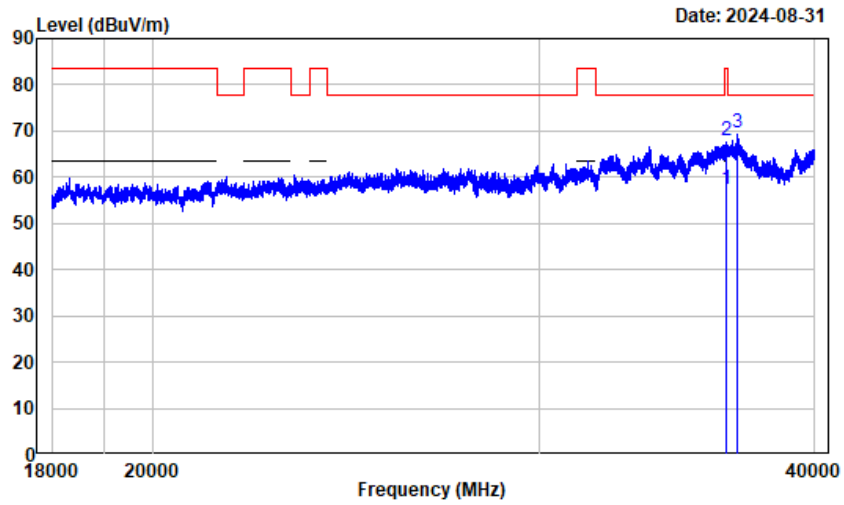


6-18GHz

Condition : Vertical
 Project No.: SZXX1240117-03999E-RF
 Tester : Zenos Qiao
 Note : 5GWiFi-Band2-A-5320

	Read	Limit	Over				
Freq	Factor	Level	Level	Line			
MHz	dB/m	dBuV	dBuV/m	dBuV/m			
1	10640.000	13.19	31.68	44.87	54.00	-9.13	Average
2	10640.000	13.19	46.12	59.31	74.00	-14.69	Peak
3	16053.000	13.74	33.83	47.57	54.00	-6.43	Average
4	16053.000	13.74	44.32	58.06	74.00	-15.94	Peak

Horizontal



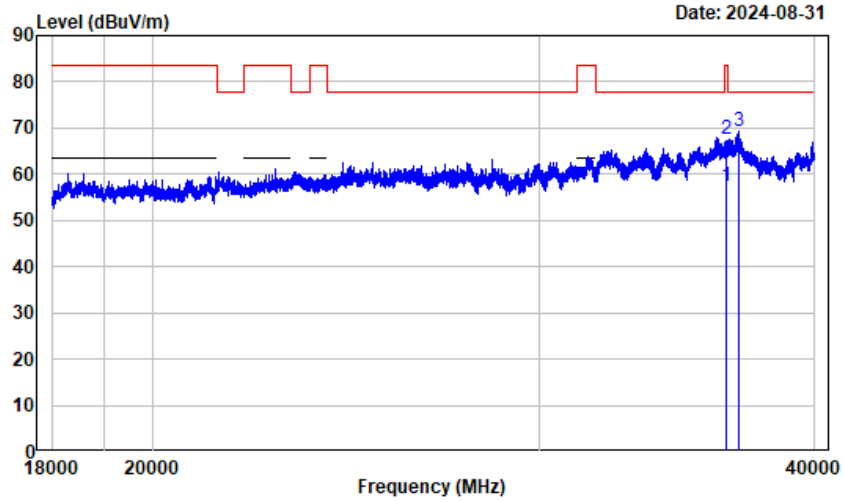
18-40GHz

Condition : Horizontal
 Project No.: SZXX1240117-03999E-RF
 Tester : Zenos Qiao
 Note : 5GWiFi-Band2-A-5320

	Read	Limit	Over				
Freq	Factor	Level	Level	Line			
MHz	dB/m	dBuV	dBuV/m	dBuV/m			
1	36488.250	25.35	32.08	57.43	63.50	-6.07	Average
2	36488.250	25.35	42.51	67.86	83.50	-15.64	Peak
3	36884.250	25.01	44.49	69.50	77.70	-8.20	Peak

Vertical

18-40GHz



Condition : Vertical
 Project No.: SZXX1240117-03999E-RF
 Tester : Zenos Qiao
 Note : 5GWiFi-Band2-A-5320

	Read	Limit	Over				
Freq	Factor	Level	Level	Line			
MHz	dB/m	dBuV	dBuV/m	dBuV/m			
1	36471.750	25.30	32.05	57.35	63.50	-6.15	Average
2	36471.750	25.30	42.38	67.68	83.50	-15.82	Peak
3	36958.500	24.94	44.40	69.34	77.70	-8.36	Peak

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

Applicable Standard

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

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

Test Procedure

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

1. Emission Bandwidth (EBW)

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

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

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

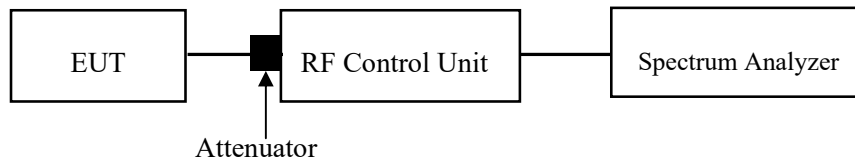
3. 99% Occupied Bandwidth:

According to ANSI C63.10-2013 Section 12.4.2&6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:

- a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

- c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
- d) Step a) through step c) might require iteration to adjust within the specified range.
- e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
- g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
- h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).



Test Data

Environmental Conditions

Temperature:	24~26 °C
Relative Humidity:	45~60 %
ATM Pressure:	101 kPa

The testing was performed by Tom Tan from 2024-02-29 to 2024-08-28.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.407(a) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

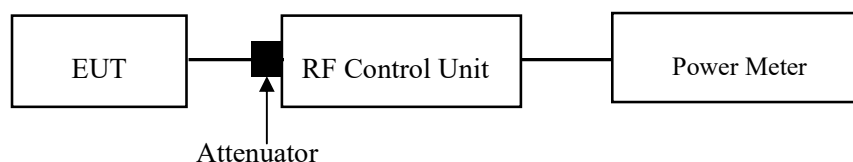
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure

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

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



Test Data**Environmental Conditions**

Temperature:	24~26 °C
Relative Humidity:	45~60 %
ATM Pressure:	101 kPa

The testing was performed by Tom Tan from 2024-02-29 to 2024-08-28.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.407(a) - POWER SPECTRAL DENSITY

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Duty cycle $\geq 98\%$

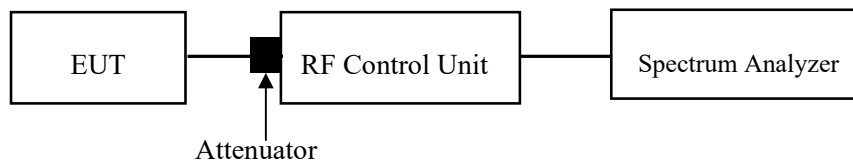
KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-1 should be applied.

Duty cycle $< 98\%$, duty cycle variations are less than $\pm 2\%$

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

Duty cycle $< 98\%$, duty cycle variations exceed $\pm 2\%$

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Method SA-3 should be applied.



Test Data**Environmental Conditions**

Temperature:	24~26 °C
Relative Humidity:	45~60 %
ATM Pressure:	101 kPa

The testing was performed by Tom Tan from 2024-02-29 to 2024-08-28.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

EUT PHOTOGRAPHS

Please refer to the attachment SZXX1240117-03999E-RF External photo and SZXX1240117-03999E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment SZXX1240117-03999E-RFB Test Setup photo.

APPENDIX

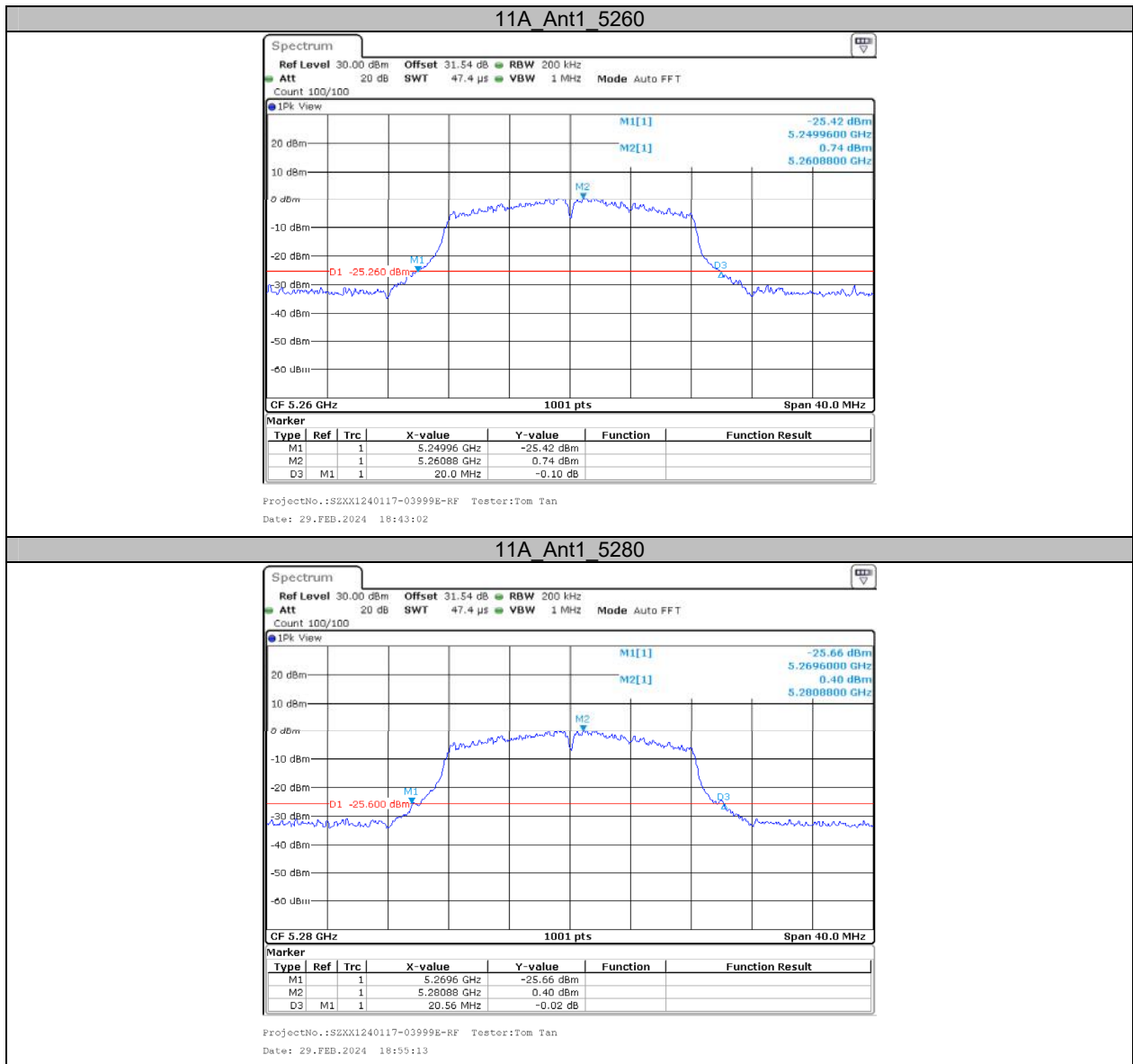
ANT1

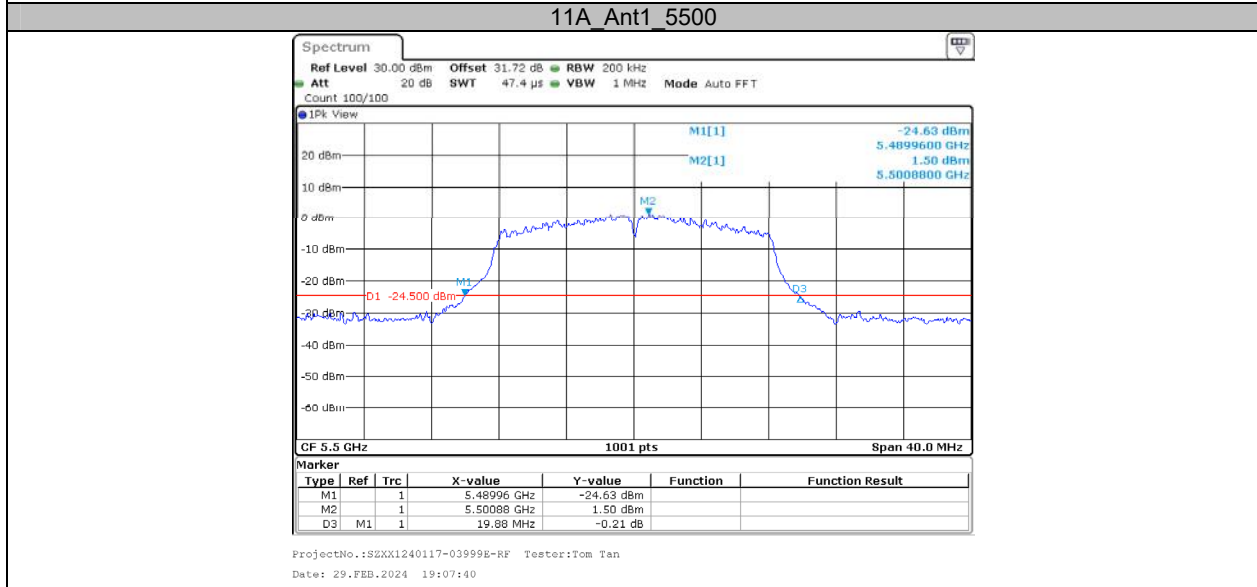
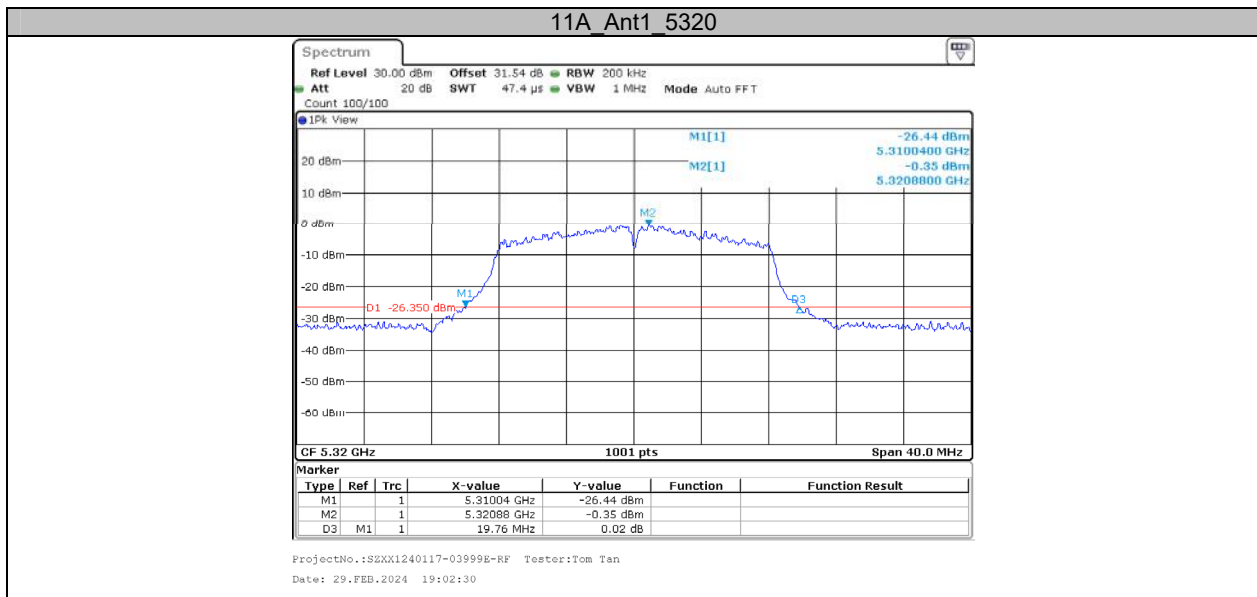
Appendix A: Emission Bandwidth

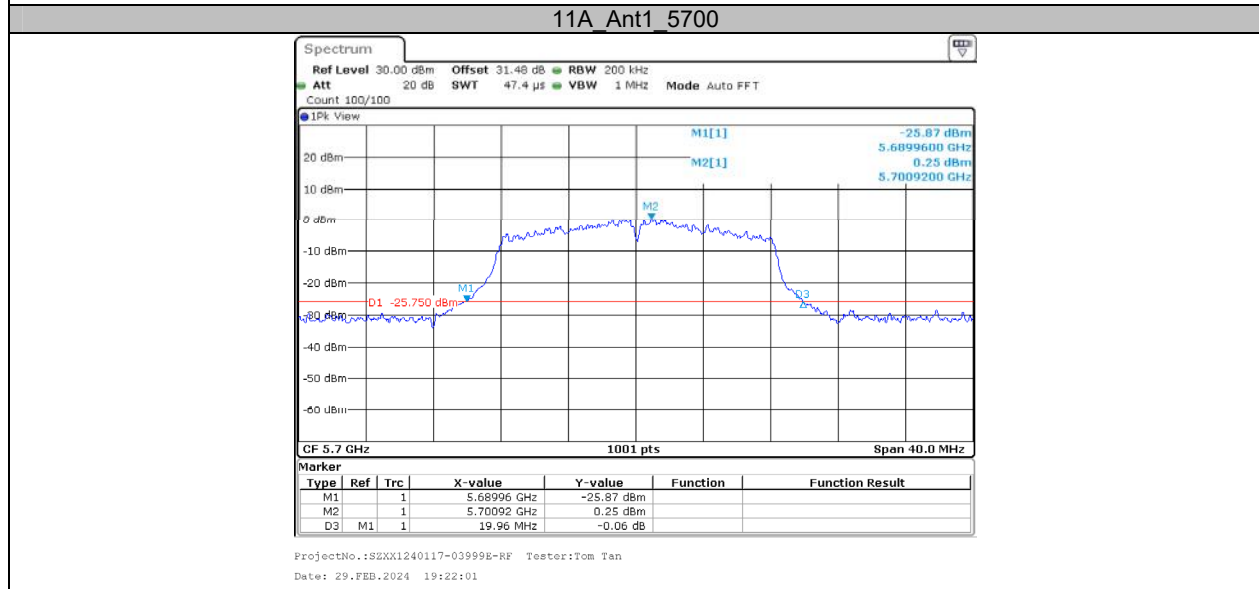
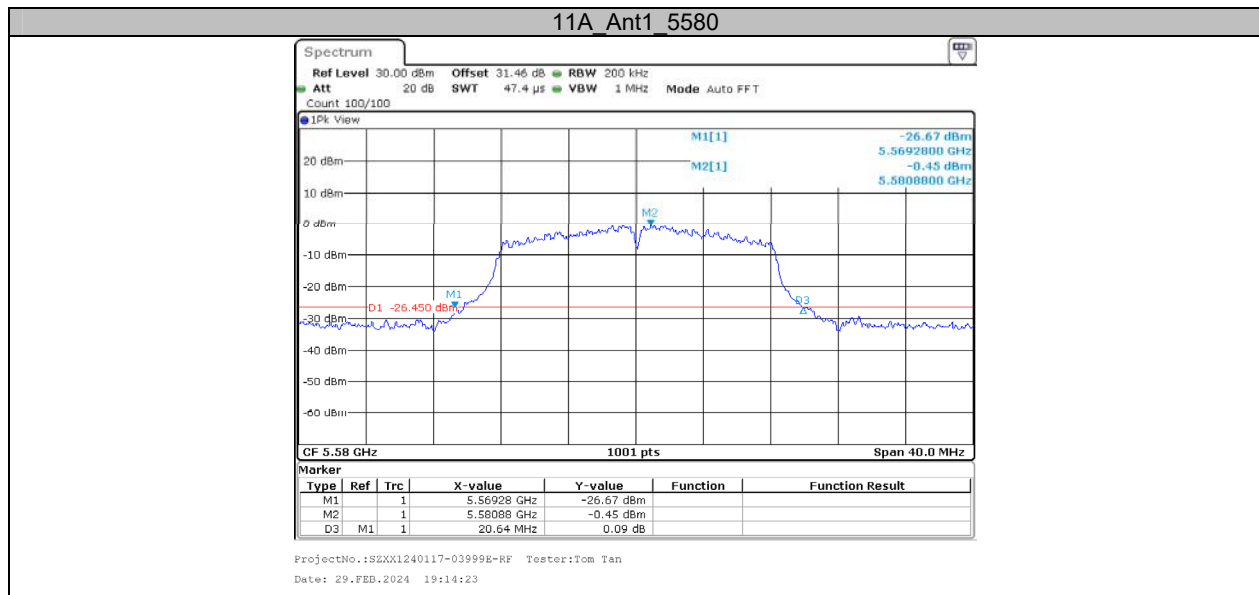
Test Result

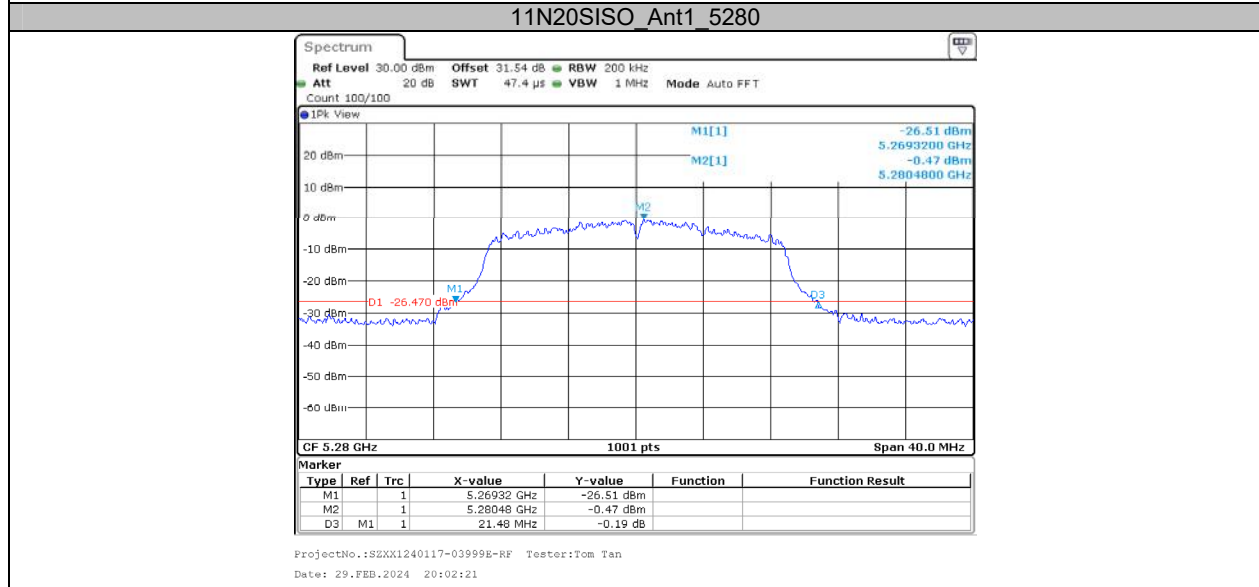
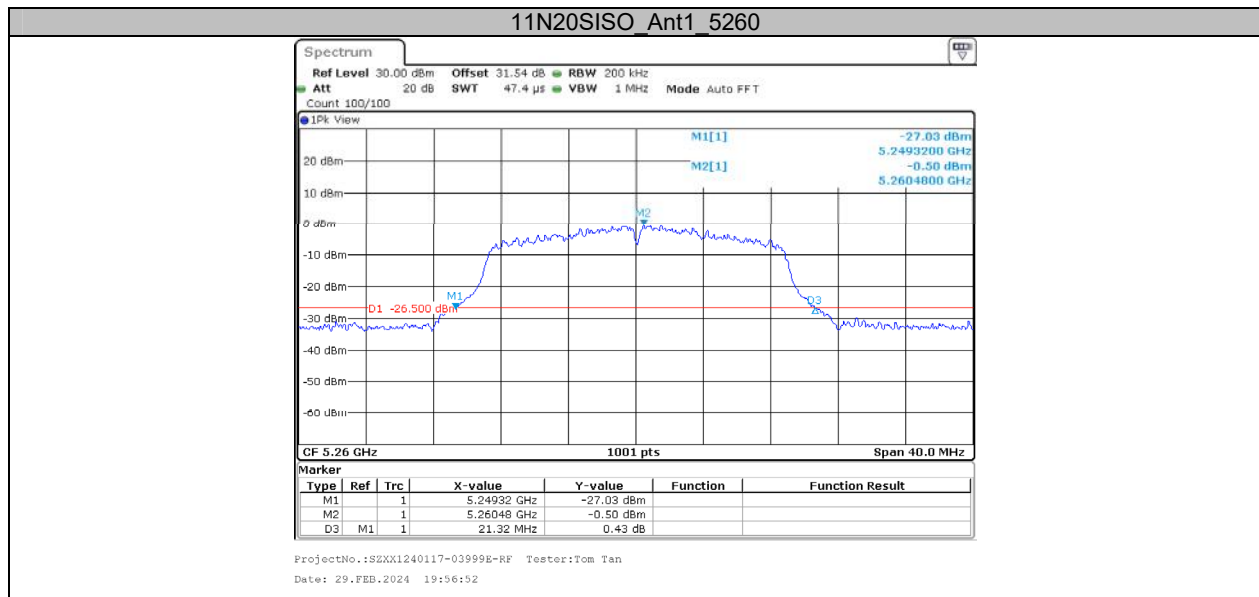
Test Mode	Antenna	Channel	26db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5260	20.00	---	---
		5280	20.56	---	---
		5320	19.76	---	---
		5500	19.88	---	---
		5580	20.64	---	---
		5700	19.96	---	---
11N20SISO	Ant1	5260	21.32	---	---
		5280	21.48	---	---
		5320	21.68	---	---
		5500	21.36	---	---
		5580	21.28	---	---
		5700	22.00	---	---
11N40SISO	Ant1	5270	38.96	---	---
		5310	39.20	---	---
		5510	38.88	---	---
		5550	38.72	---	---
		5670	39.28	---	---

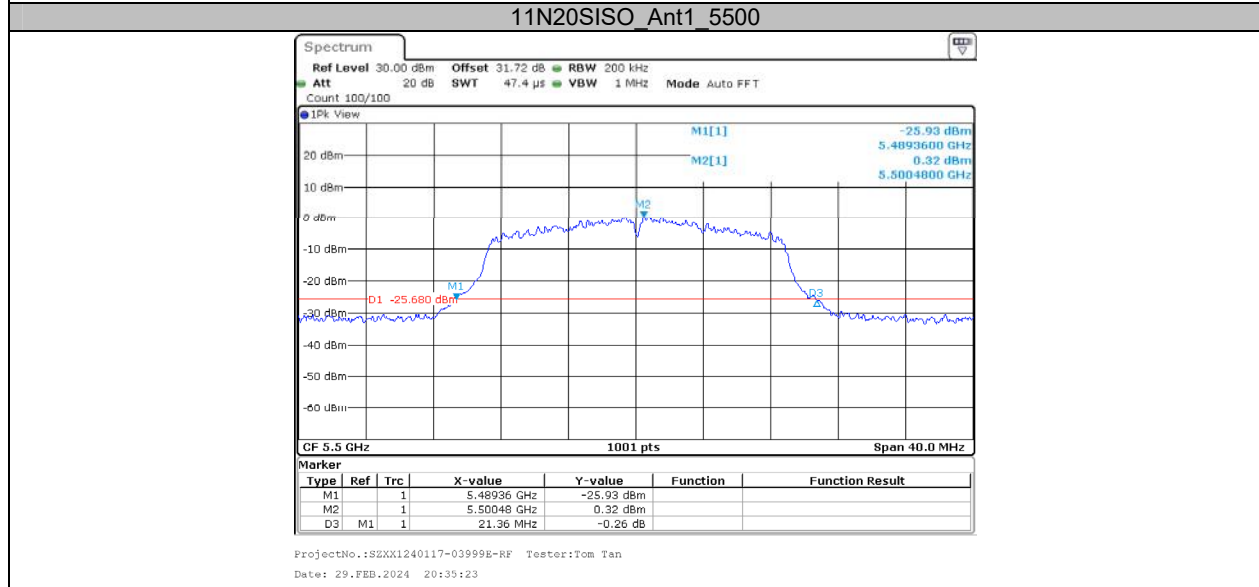
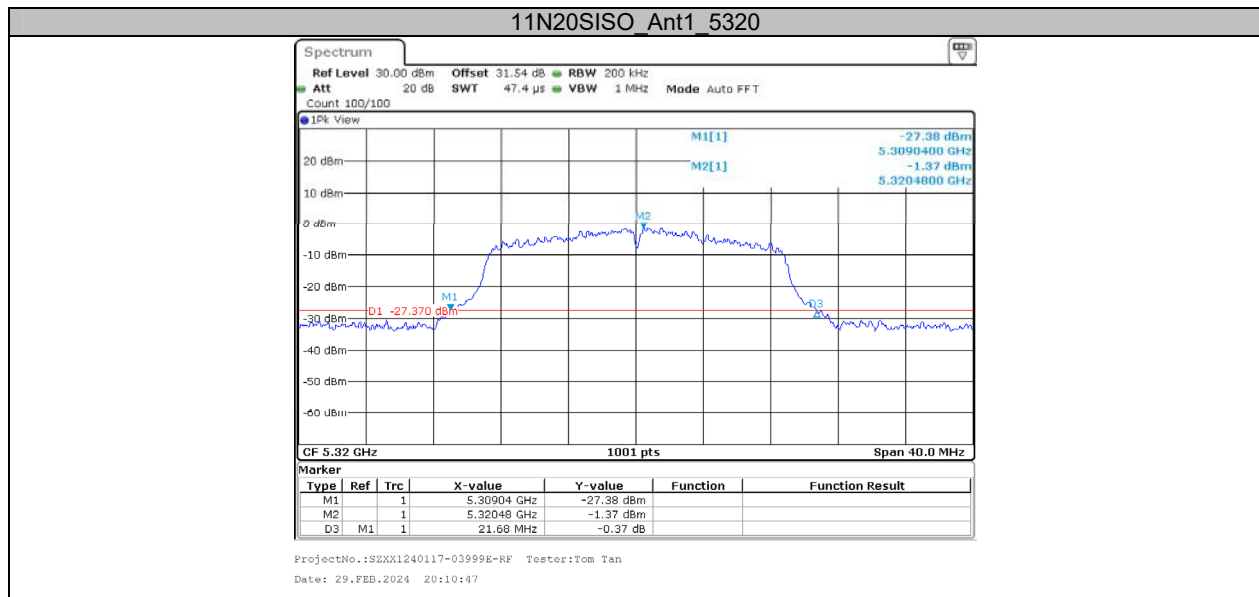
Test Graphs

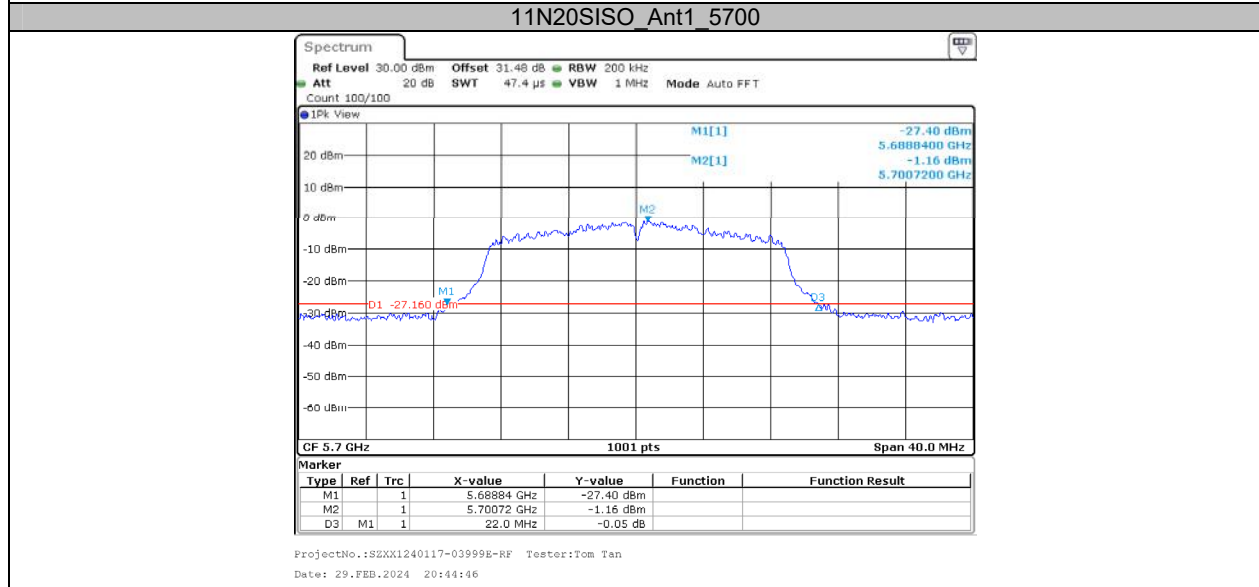
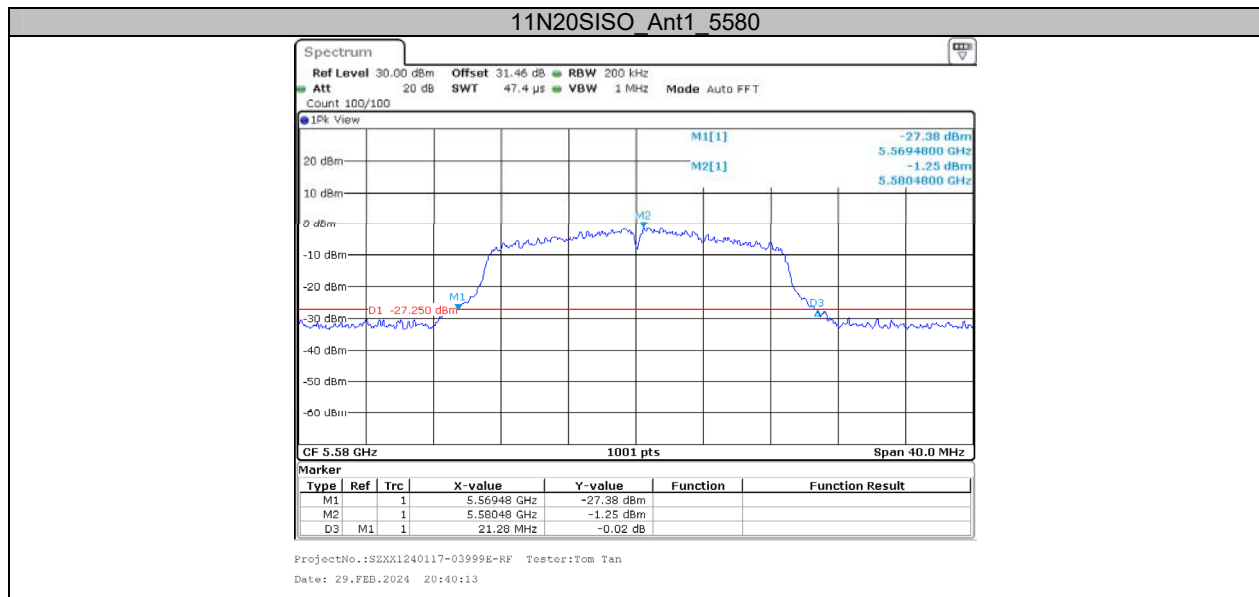


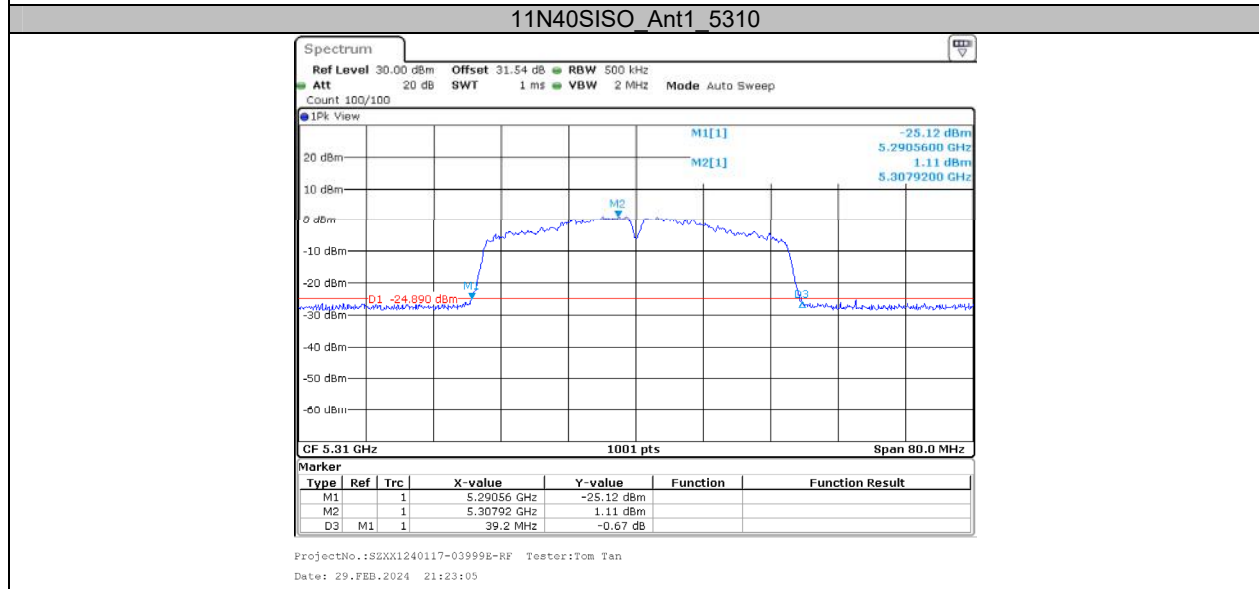
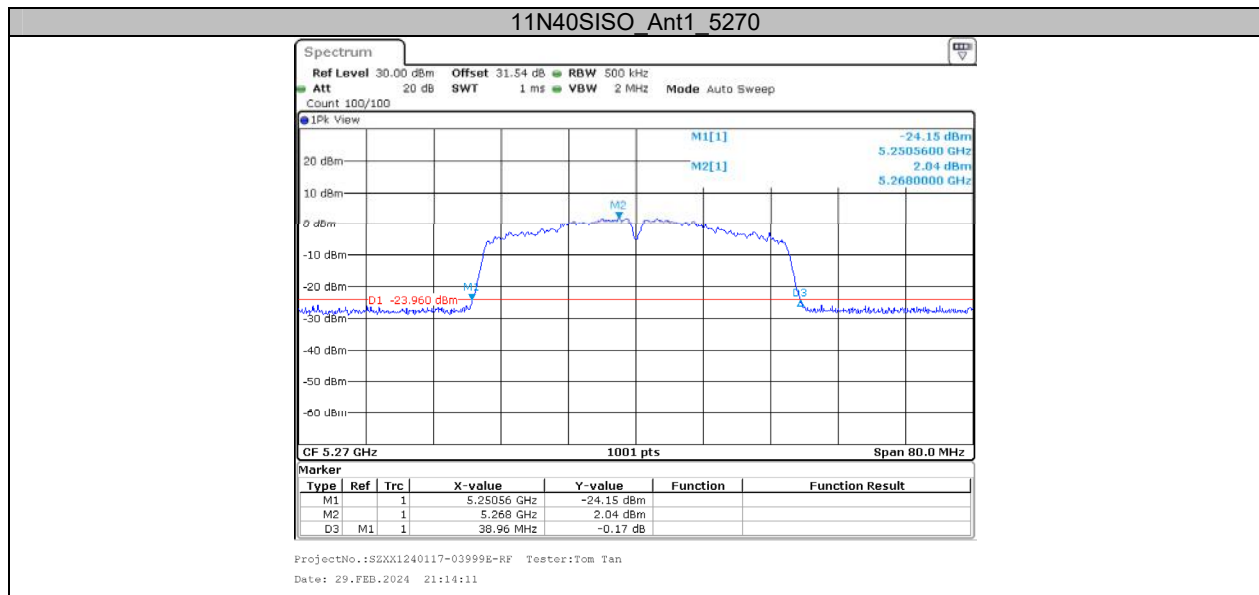


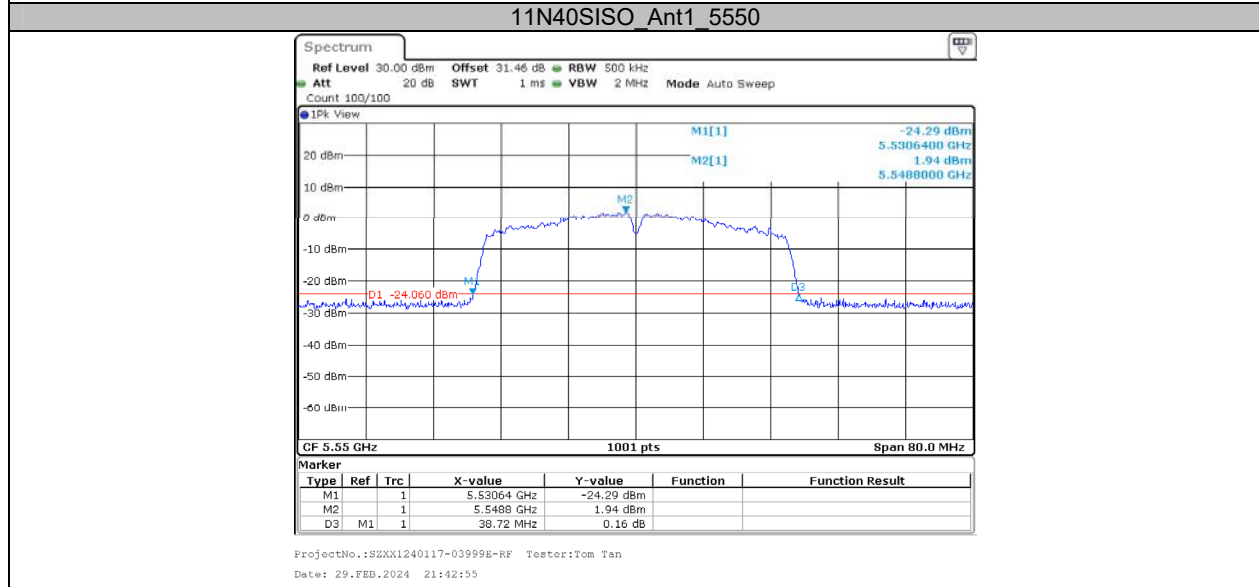
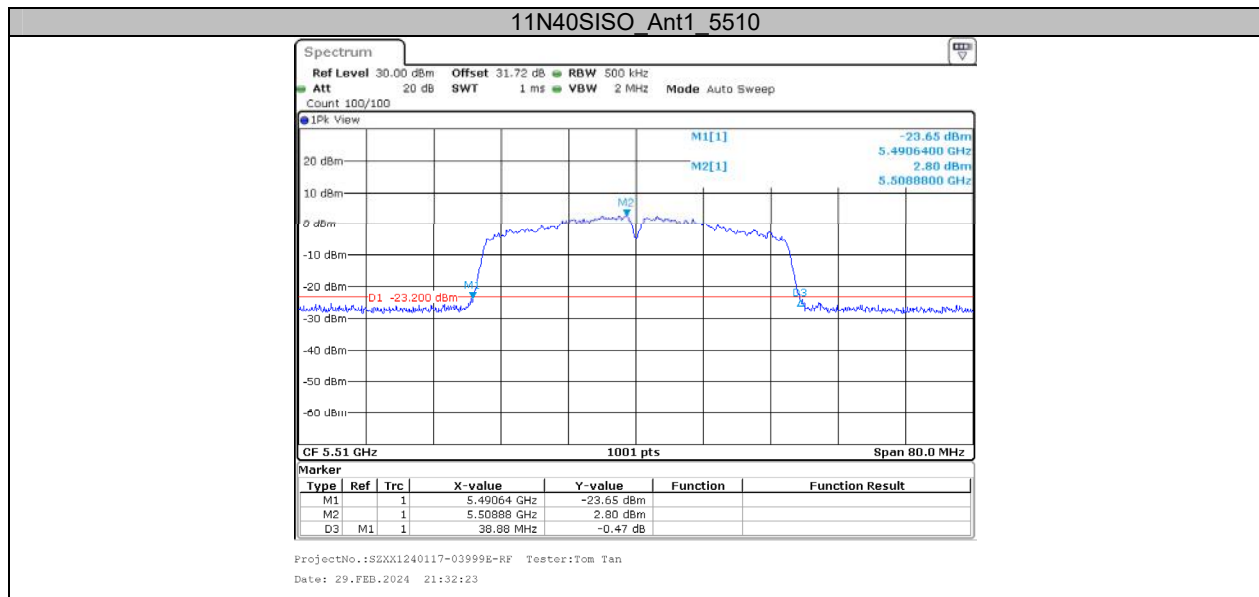


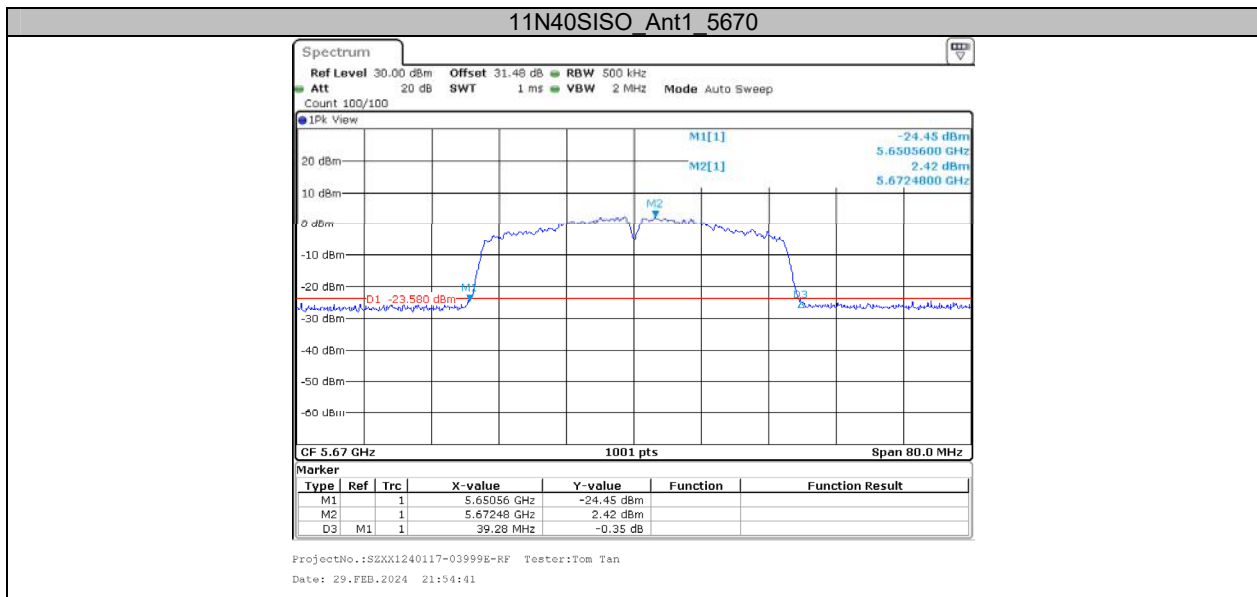












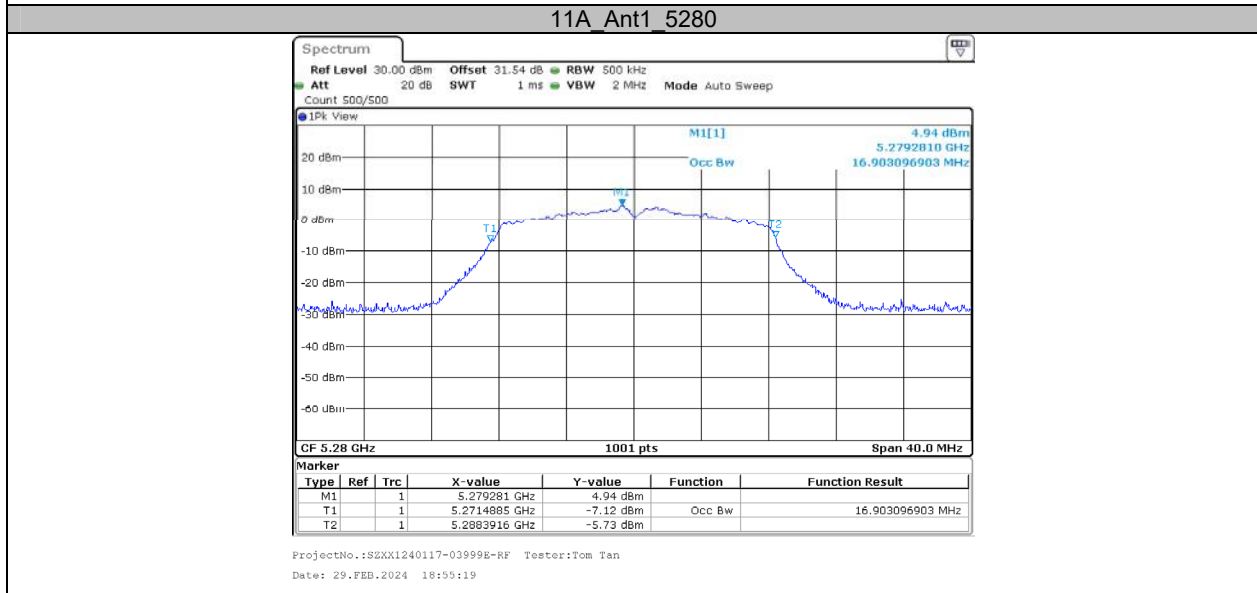
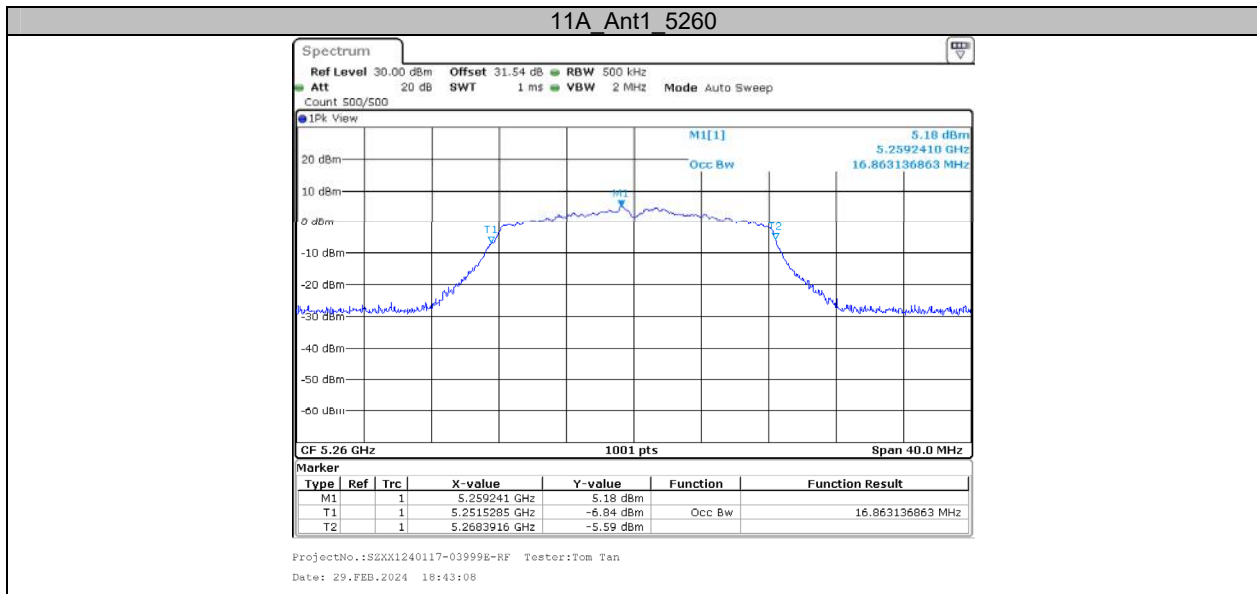
Appendix B: Occupied channel bandwidth

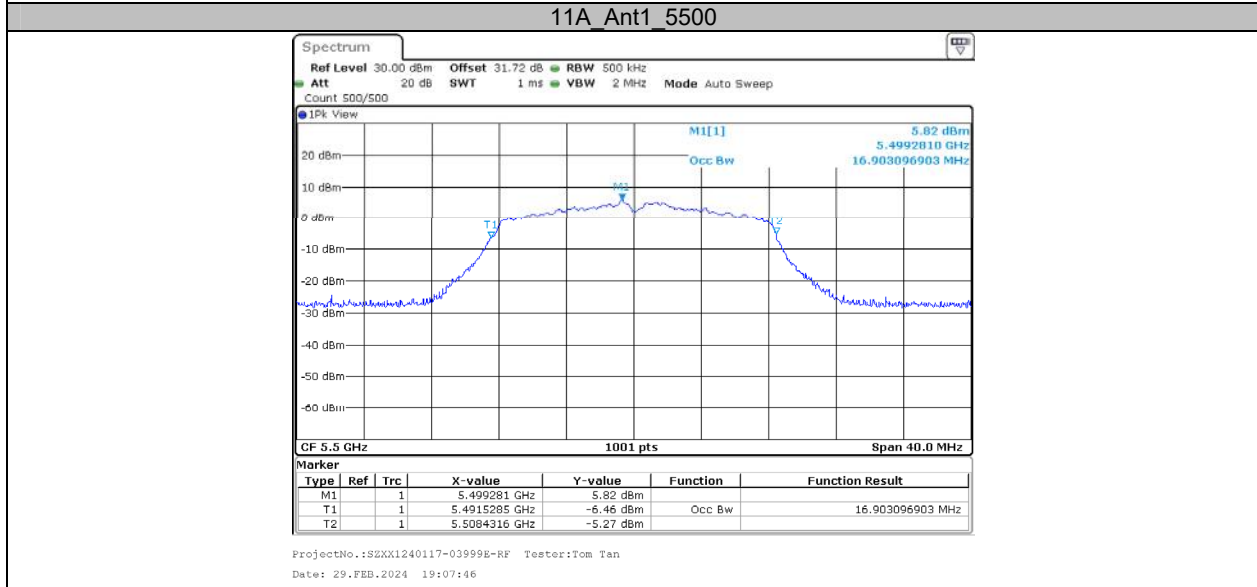
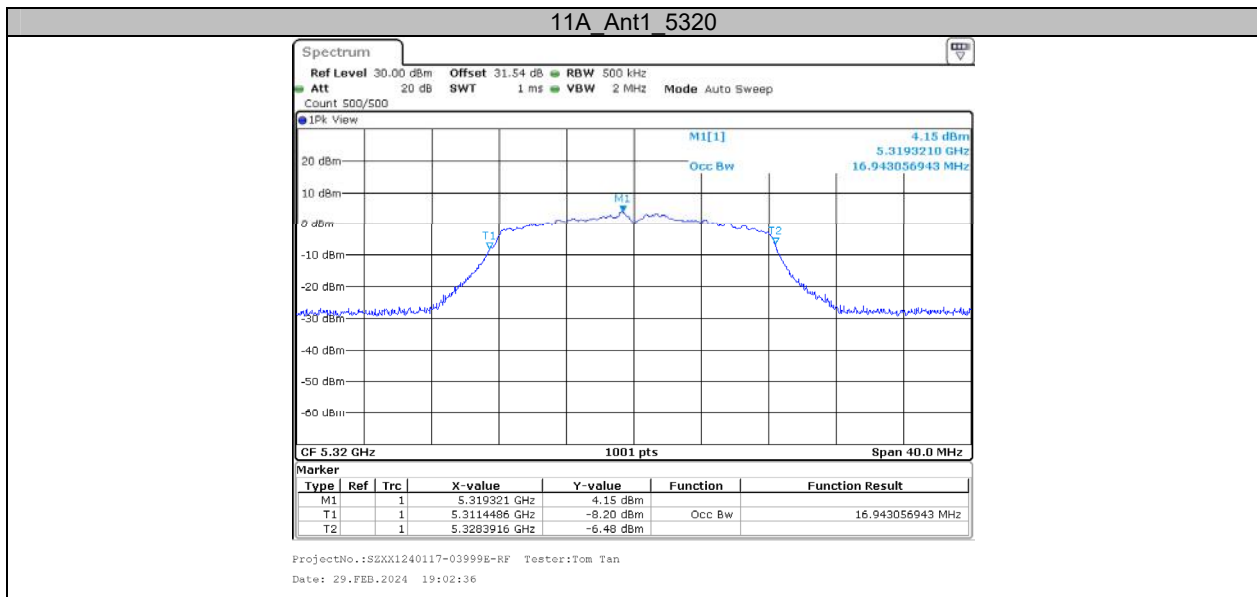
Test Result

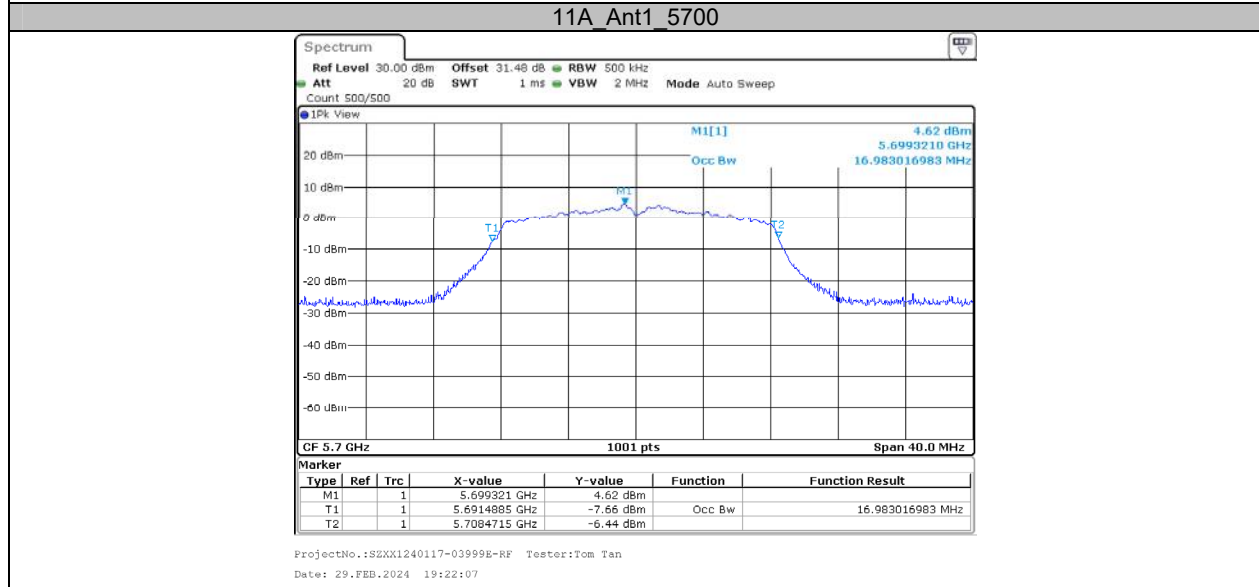
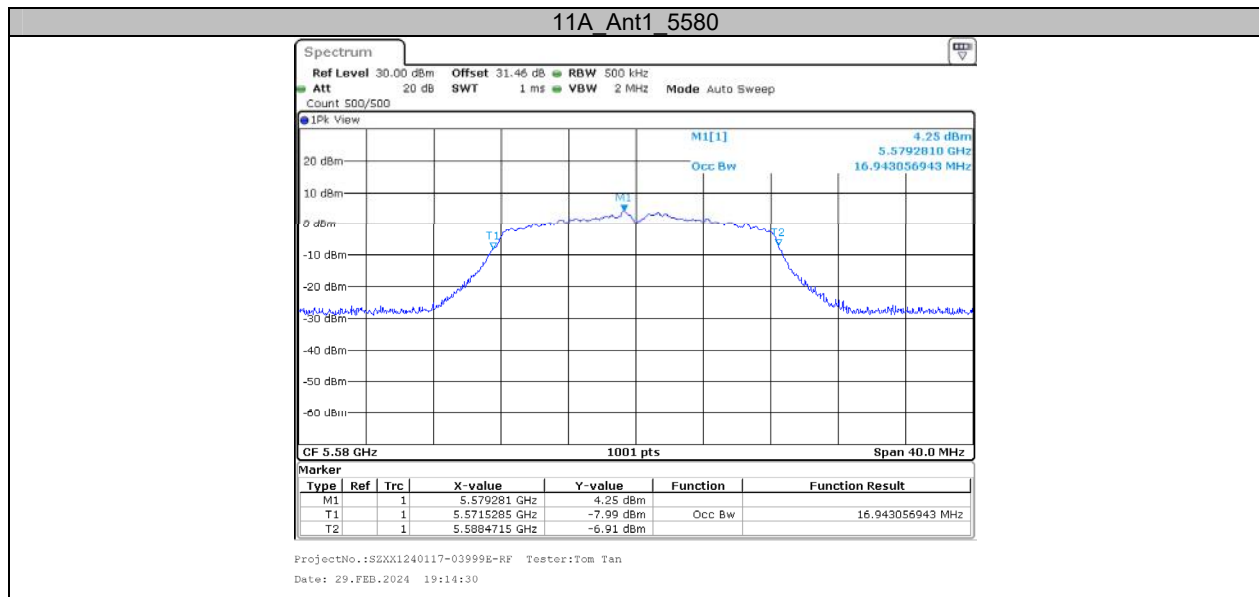
Test Mode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11A	Ant1	5260	16.863	---	---
		5280	16.903	---	---
		5320	16.943	---	---
		5500	16.903	---	---
		5580	16.943	---	---
		5700	16.983	---	---
		5745	16.943	---	---
		5785	16.983	---	---
		5825	16.903	---	---
11N20SISO	Ant1	5260	17.942	---	---
		5280	17.942	---	---
		5320	18.022	---	---
		5500	17.942	---	---
		5580	18.062	---	---
		5700	18.142	---	---
		5745	18.022	---	---
		5785	18.022	---	---
		5825	17.902	---	---
11N40SISO	Ant1	5270	35.405	---	---
		5310	35.485	---	---
		5510	35.405	---	---
		5550	35.485	---	---
		5670	35.485	---	---
		5755	35.564	---	---
		5795	35.564	---	---

Note: for 5725-5850MHz band, the OBW will not extend into U-NII-2C band.

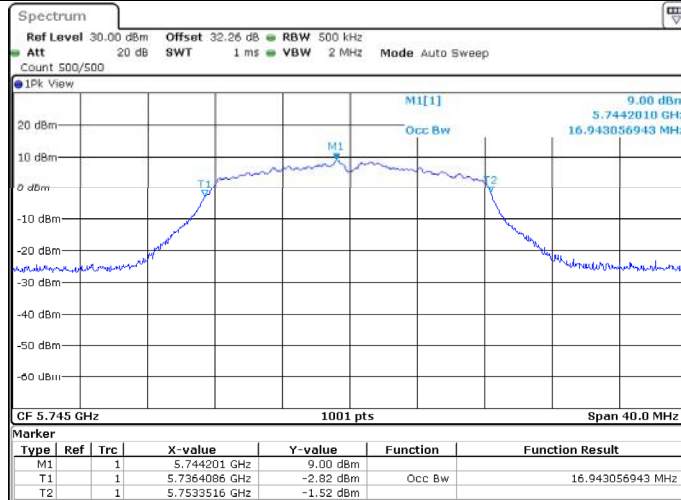
Test Graphs





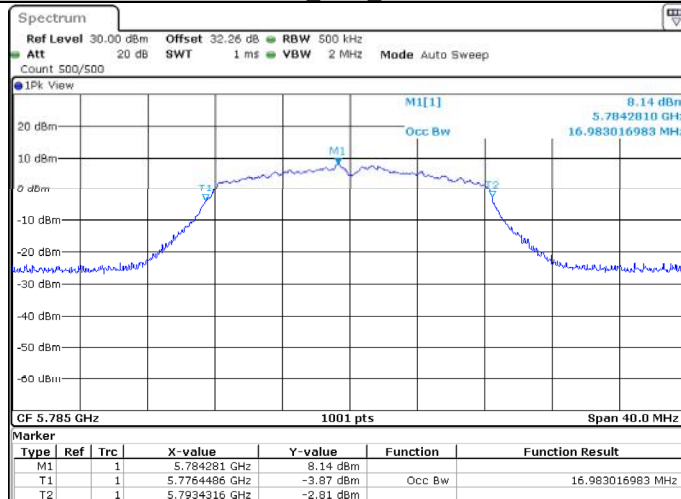


11A_Ant1_5745

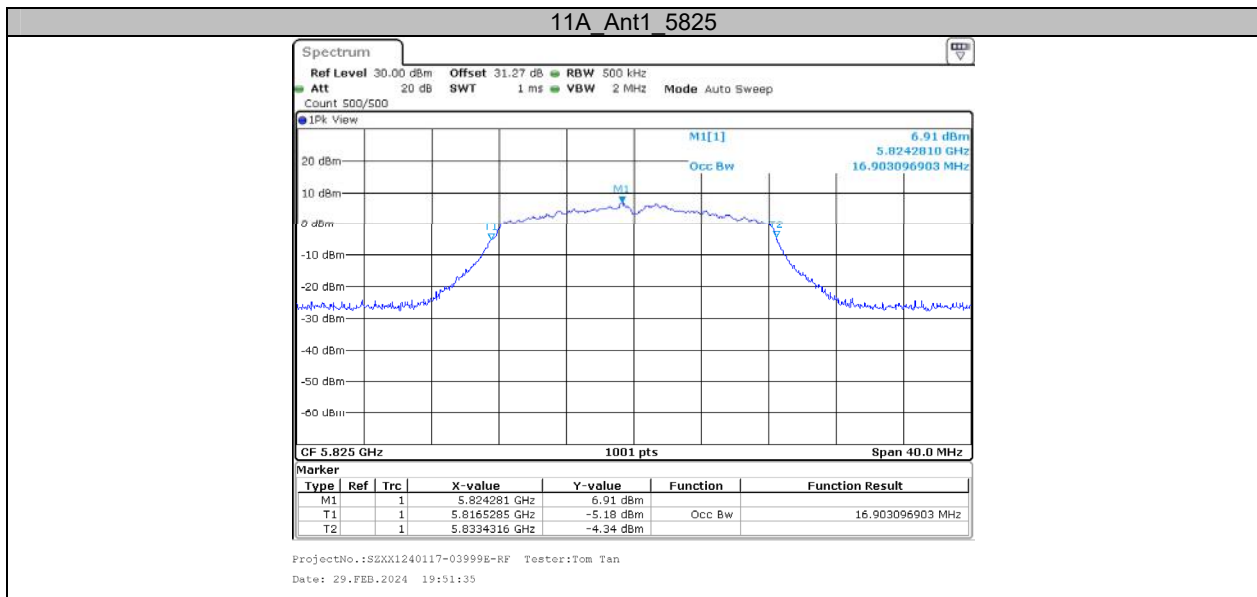


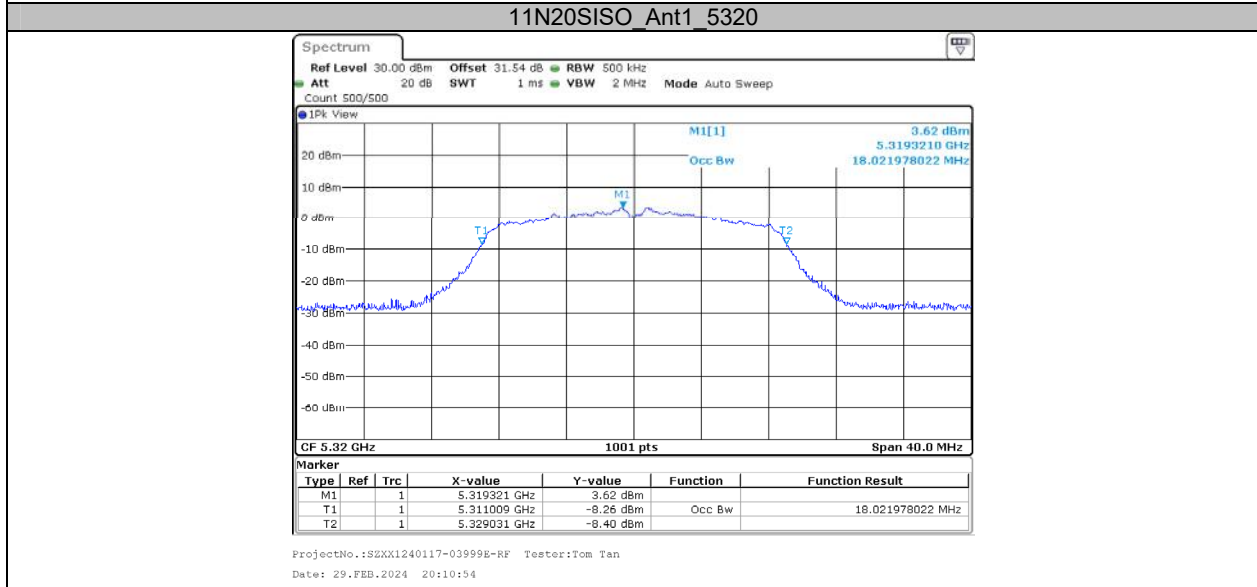
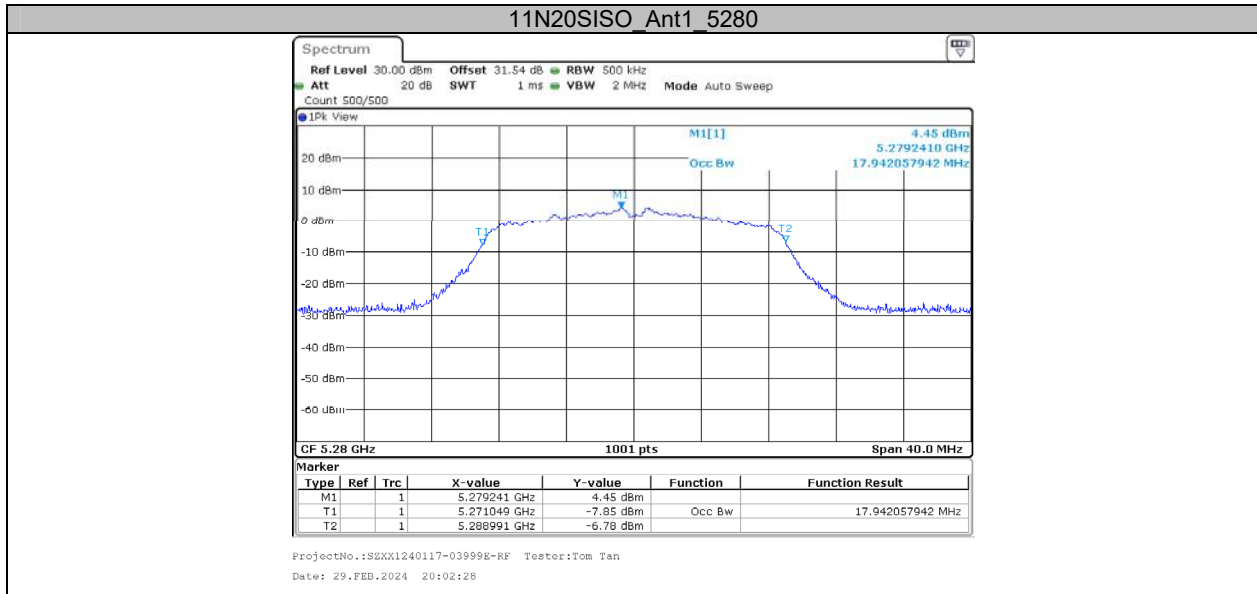
ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
 Date: 29.FEB.2024 19:35:03

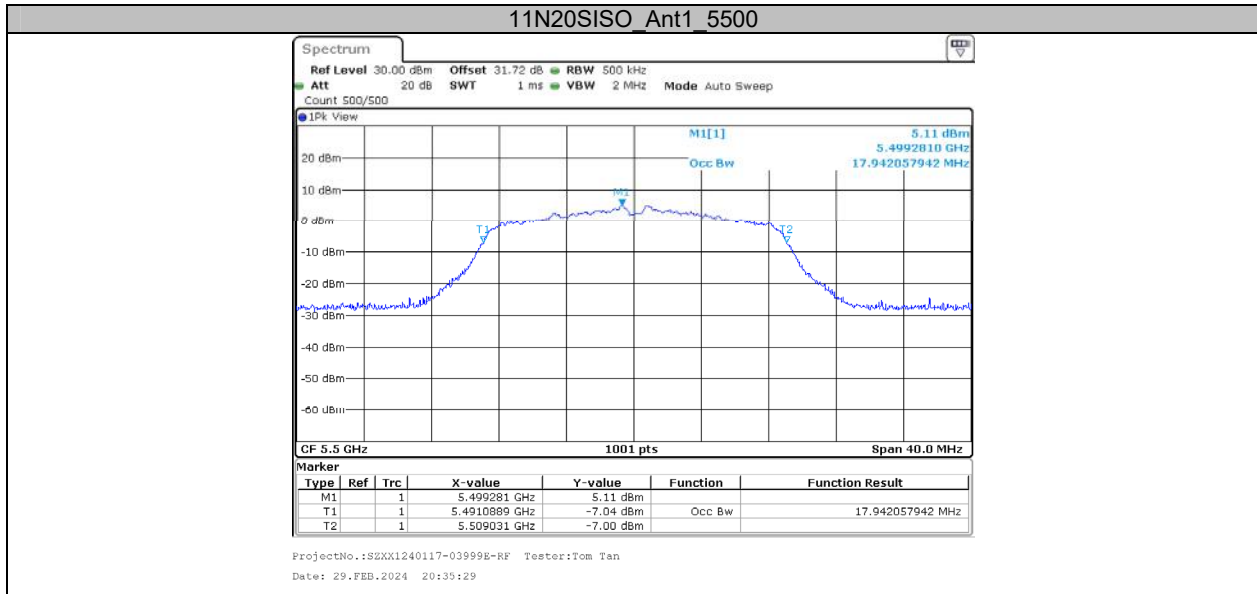
11A_Ant1_5785

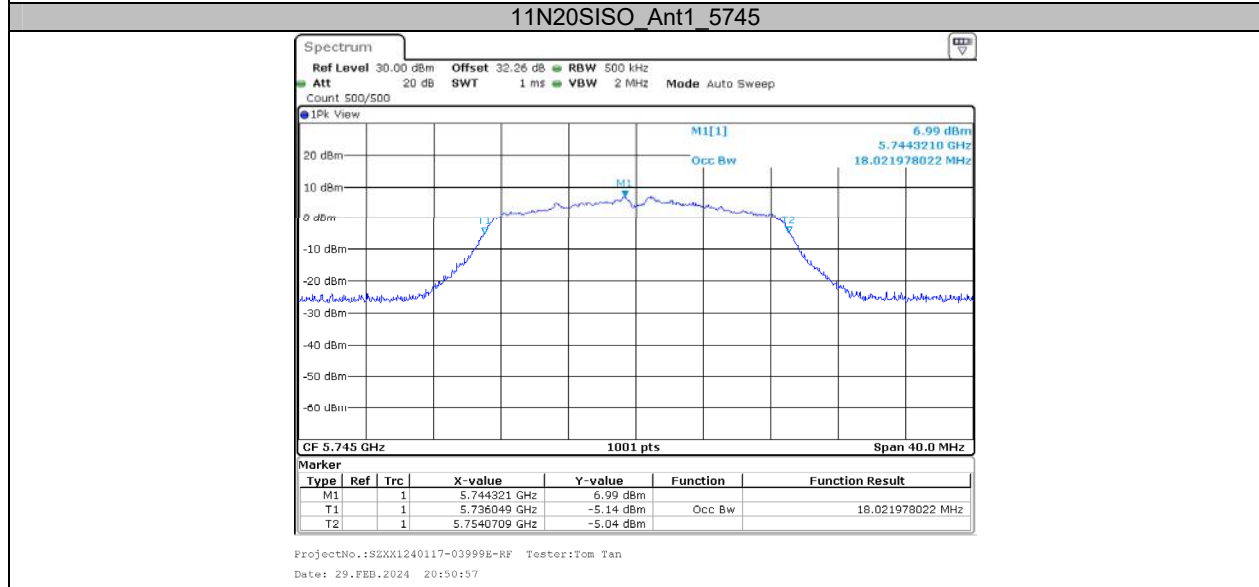
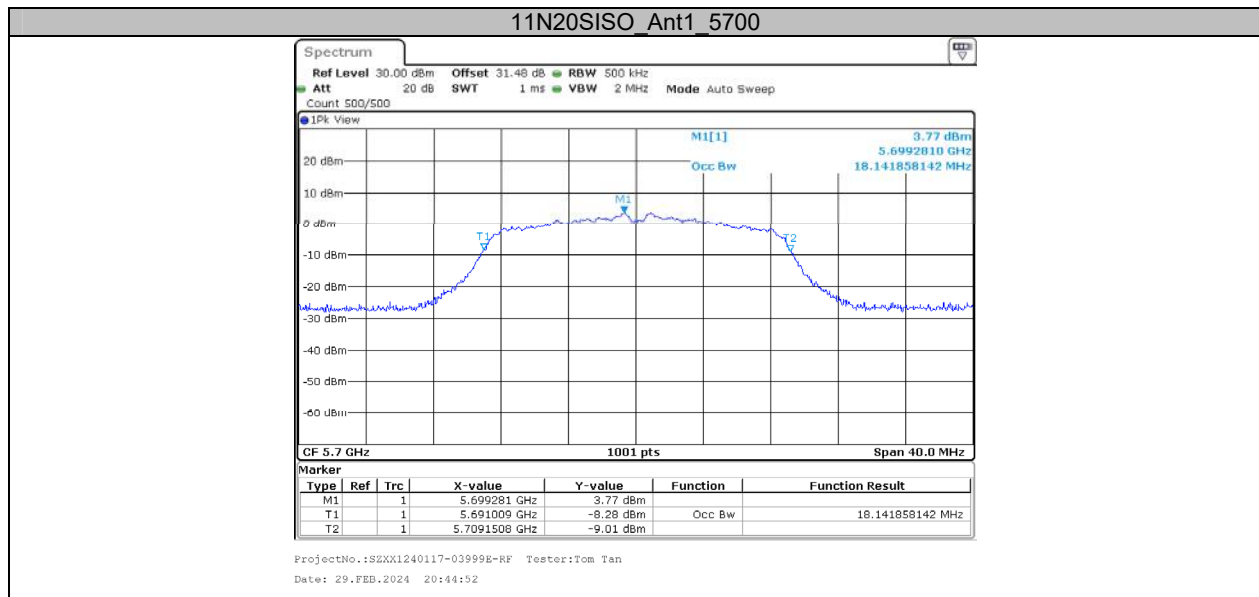


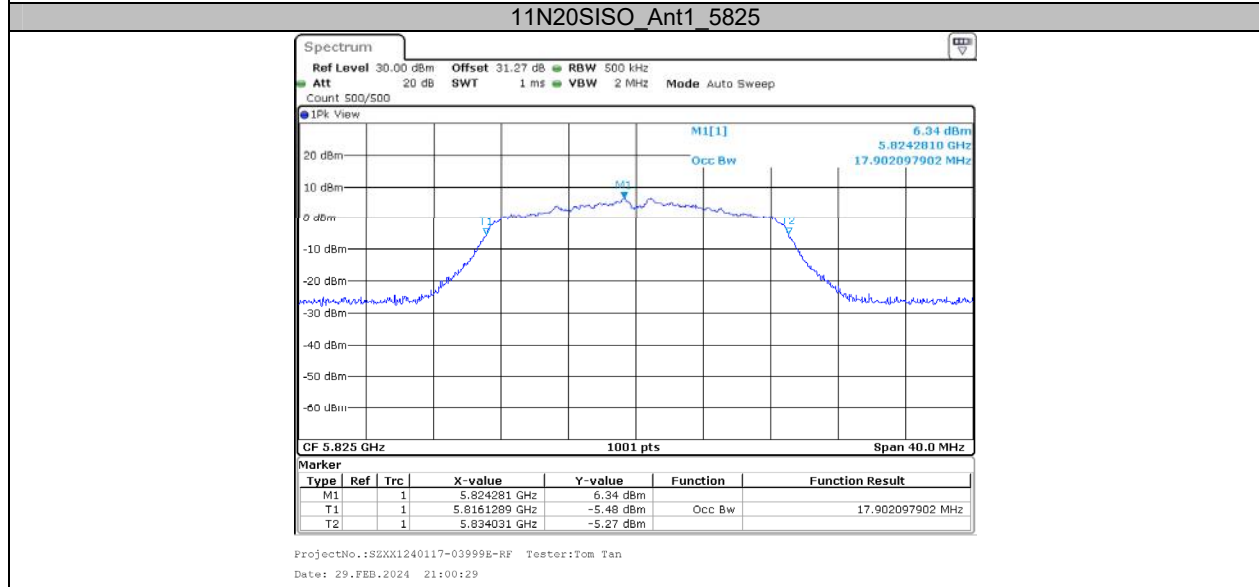
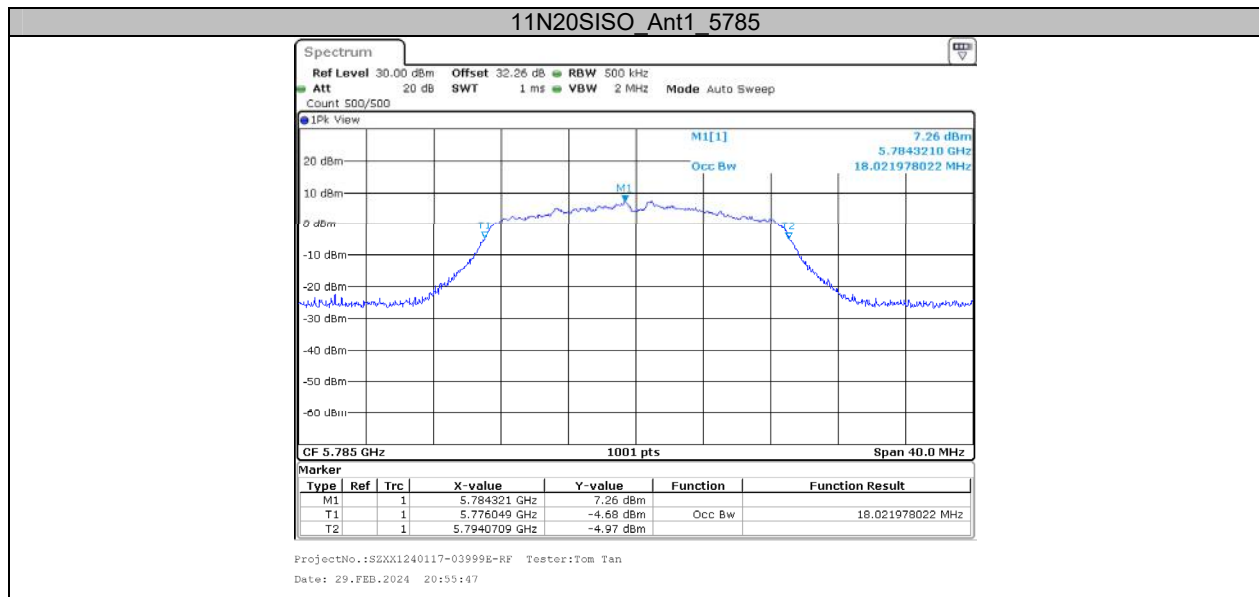
ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
 Date: 29.FEB.2024 19:46:26

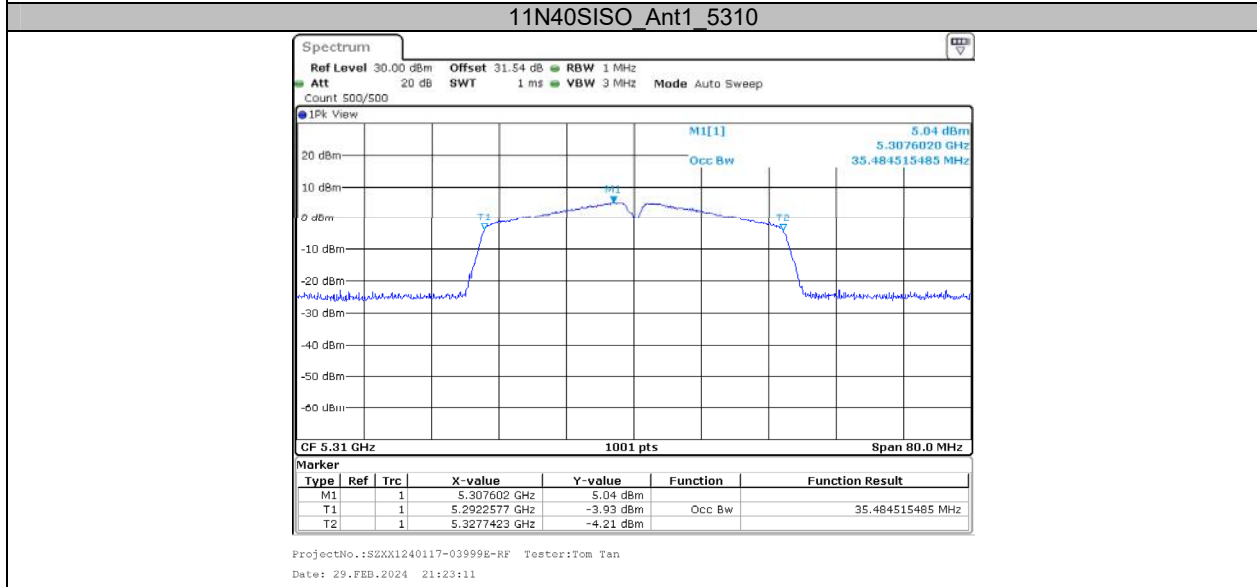
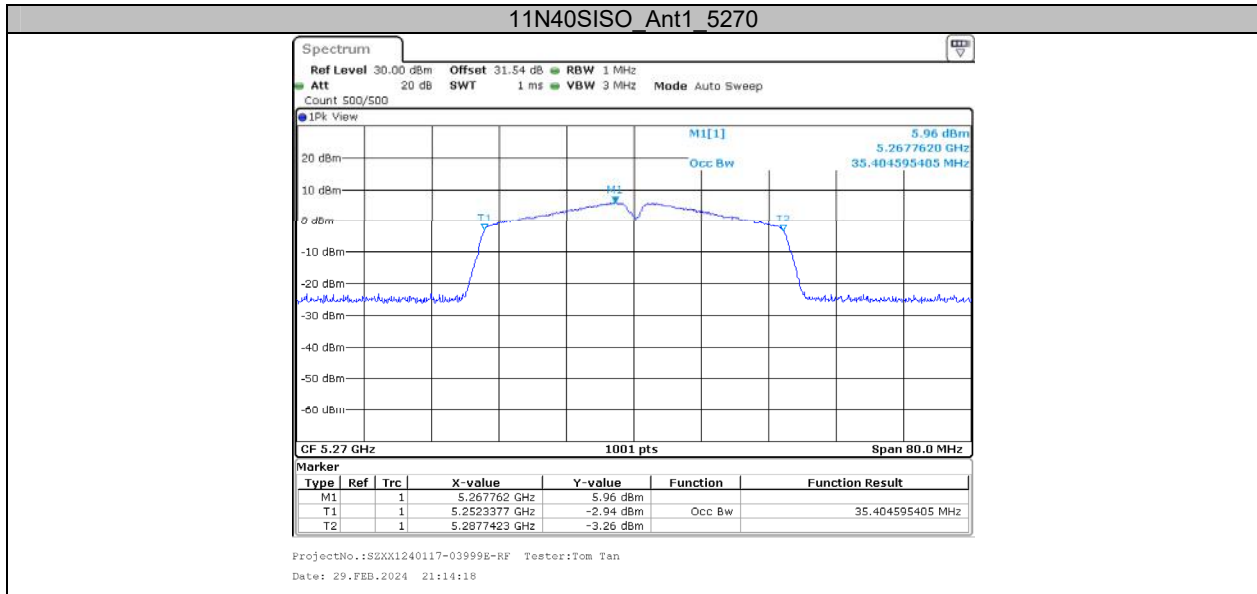


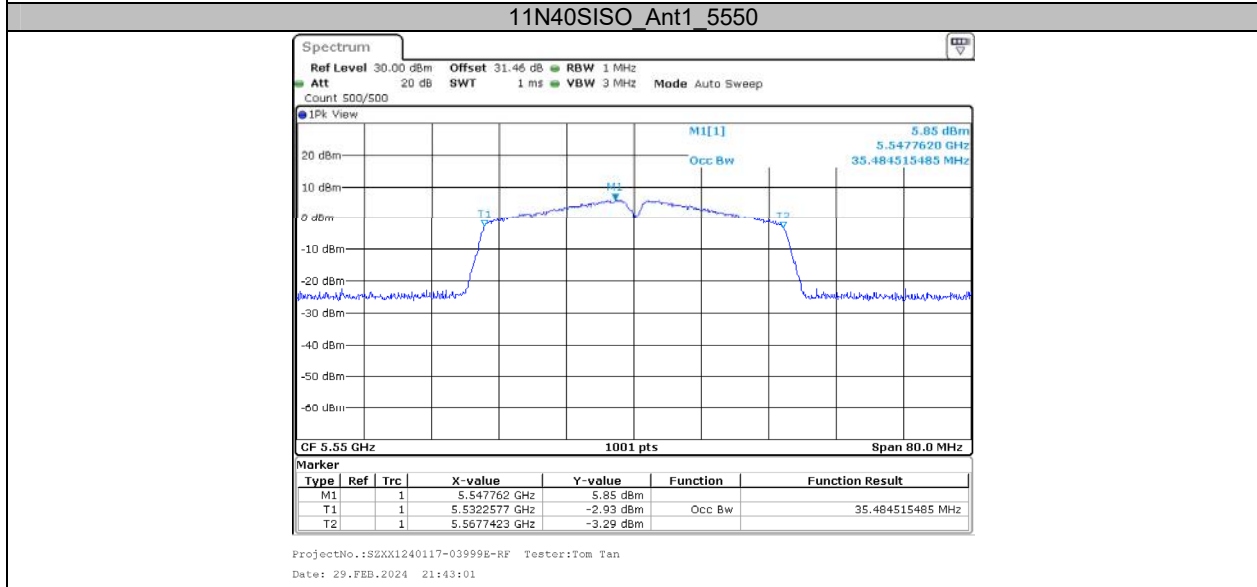
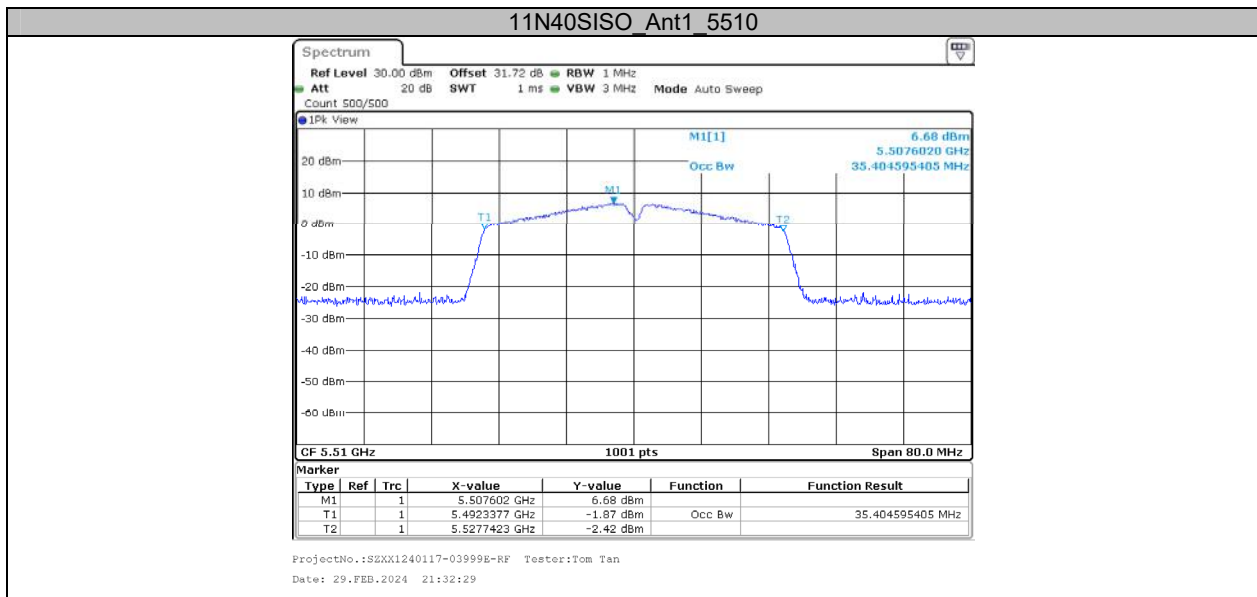


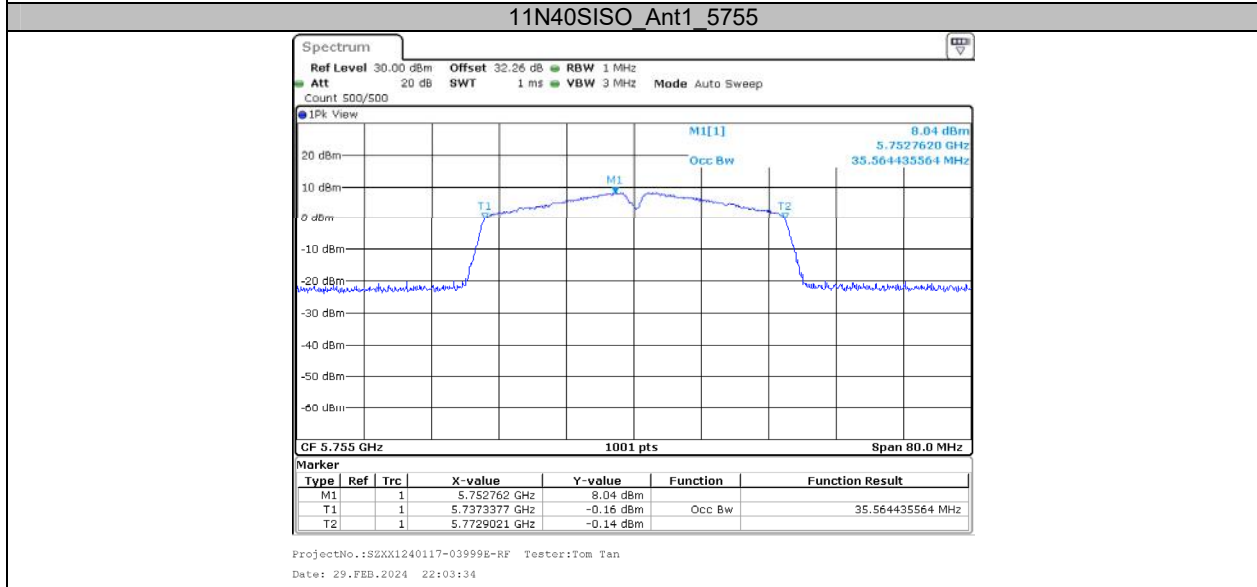
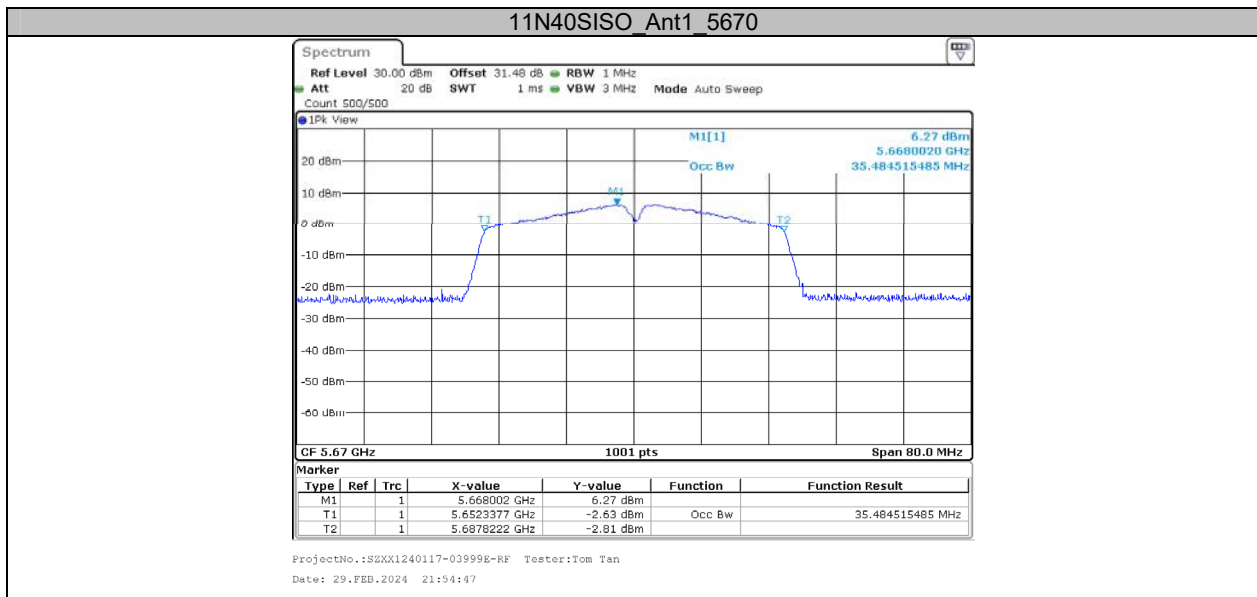


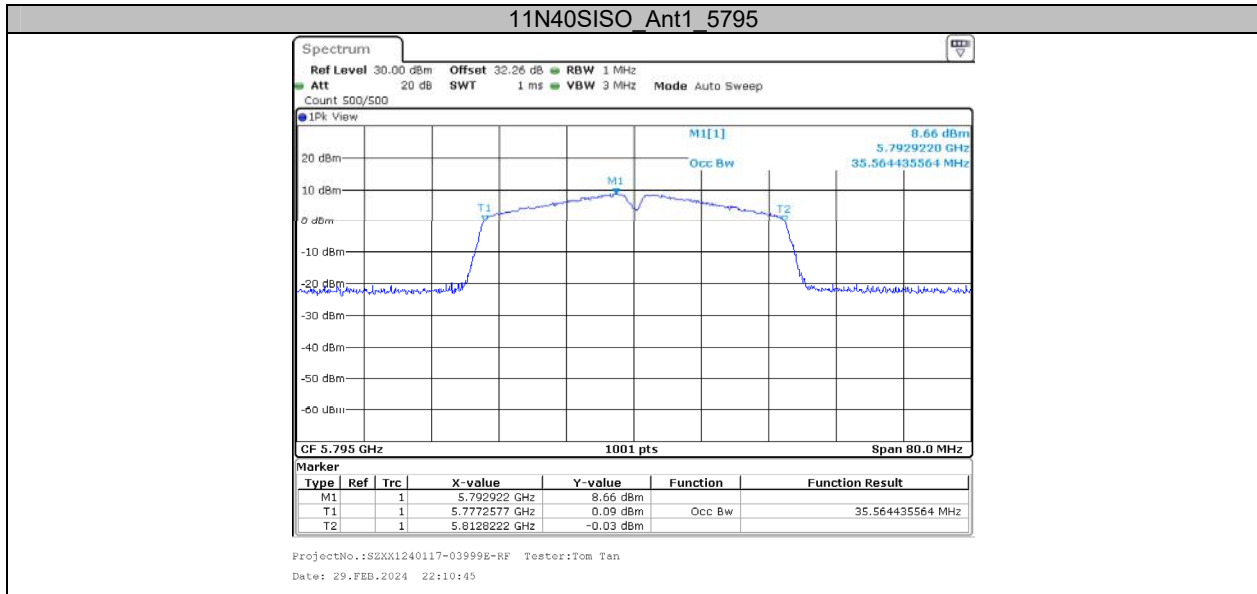










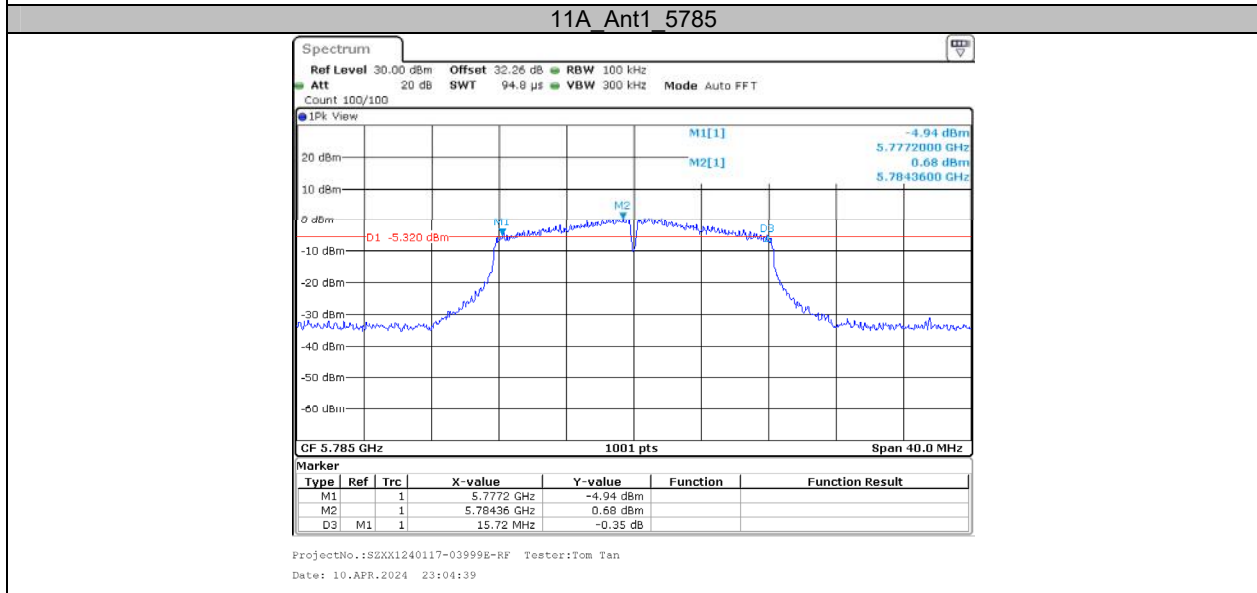
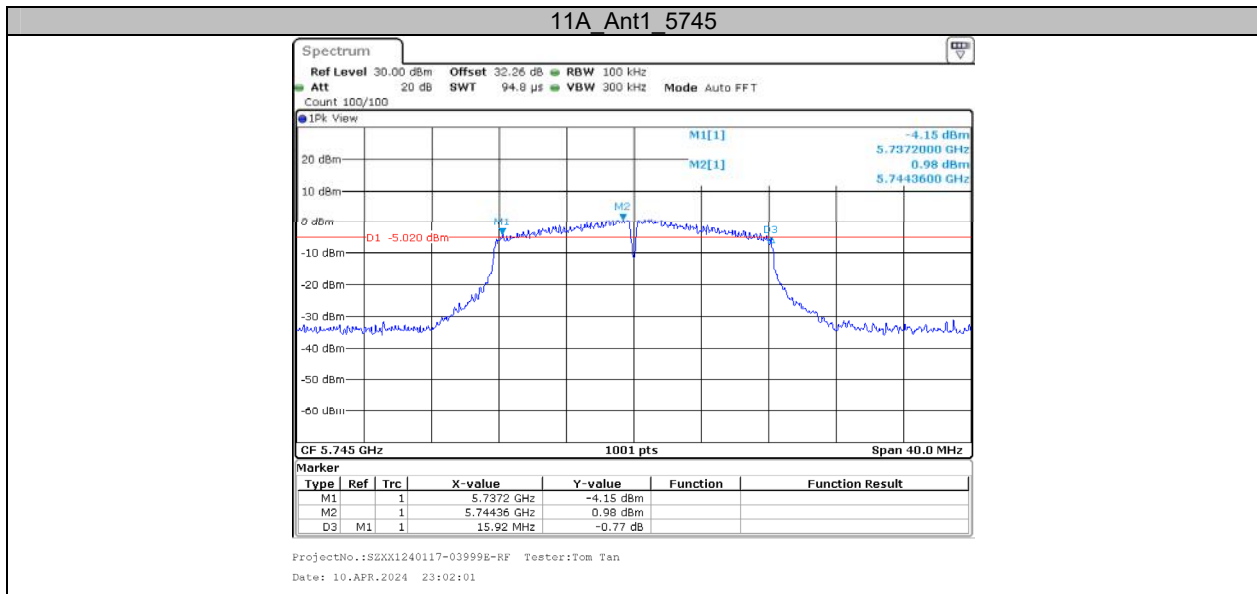


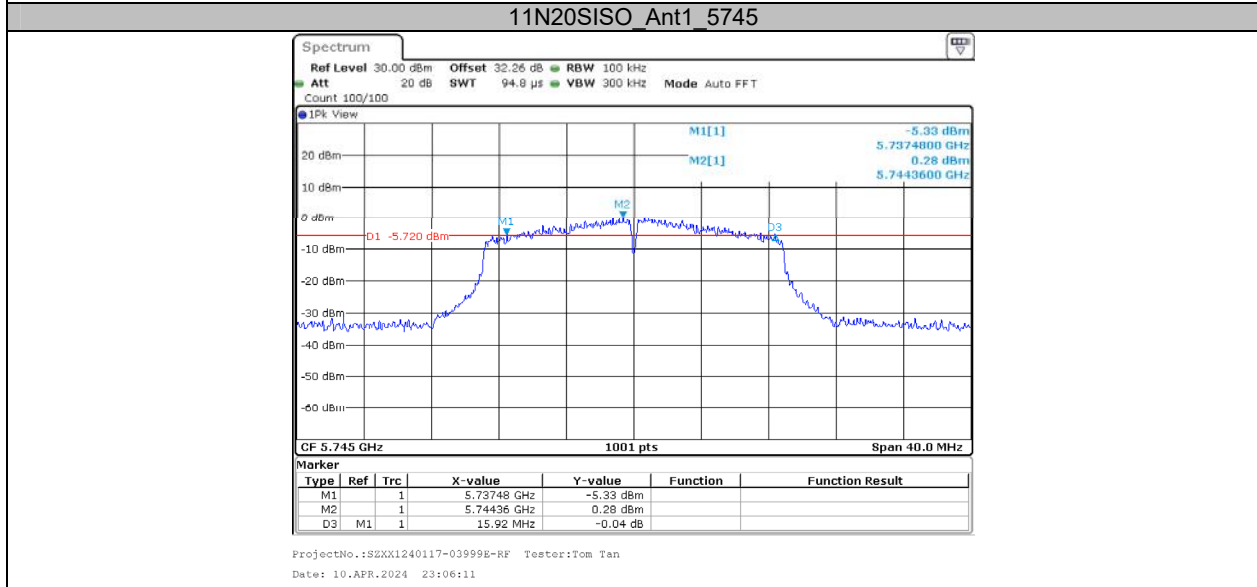
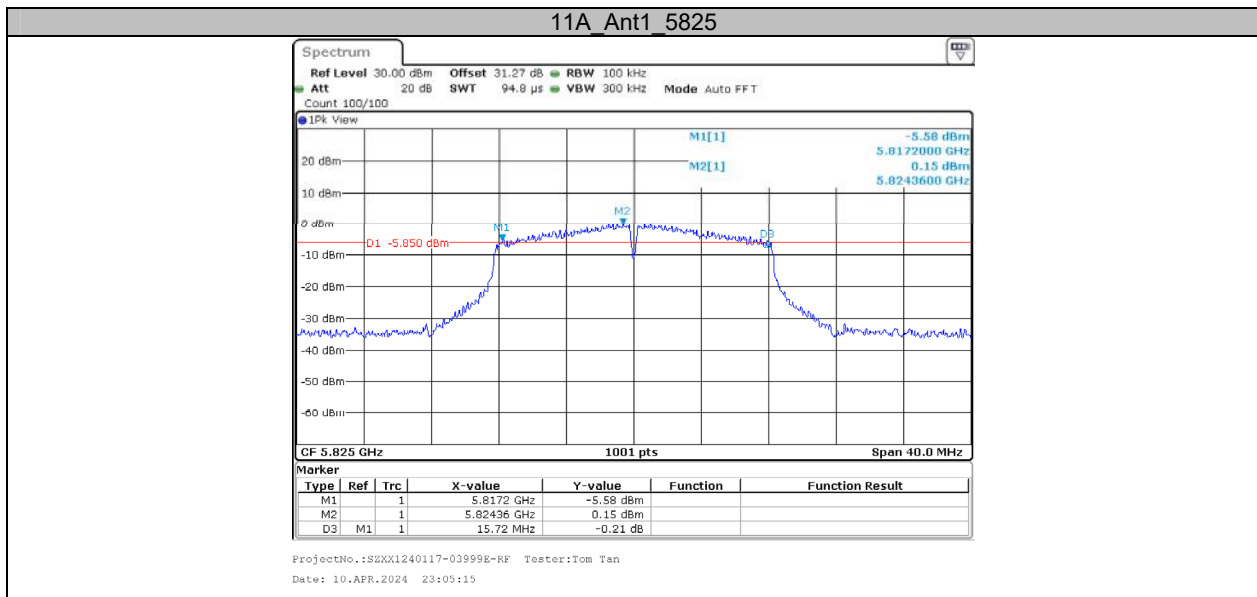
Appendix C: Min emission bandwidth

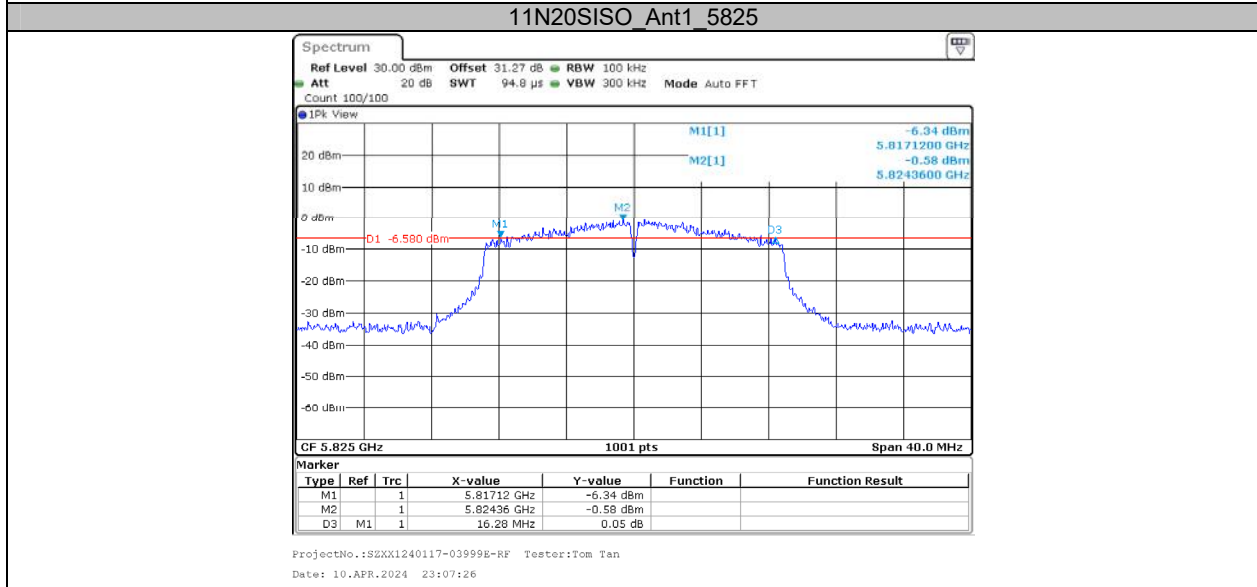
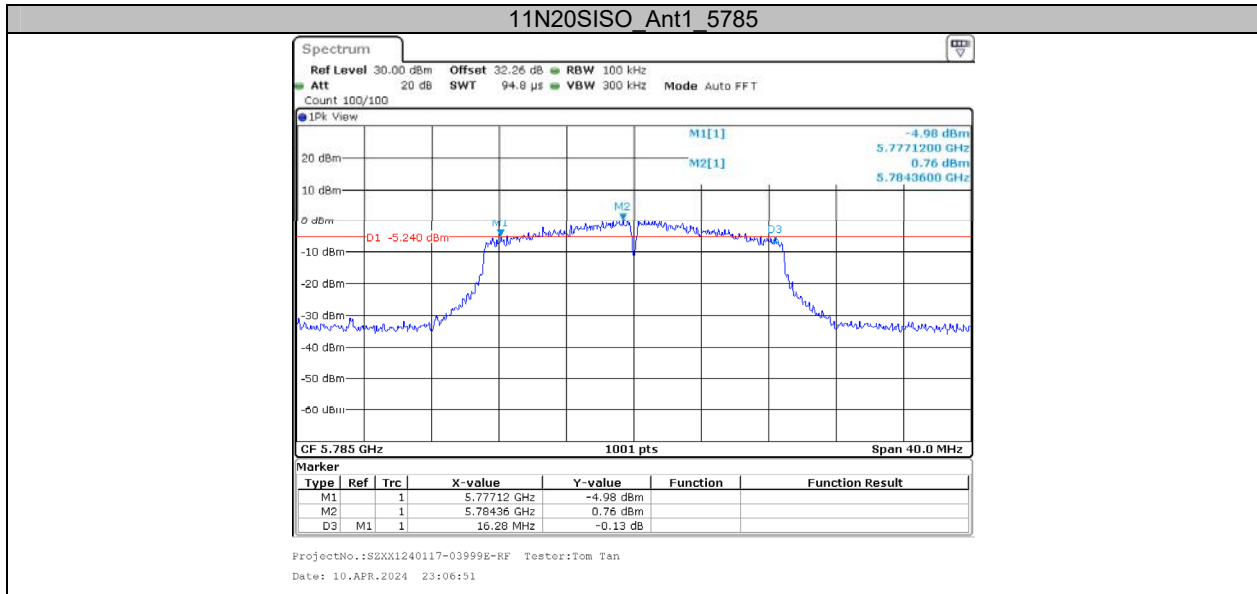
Test Result

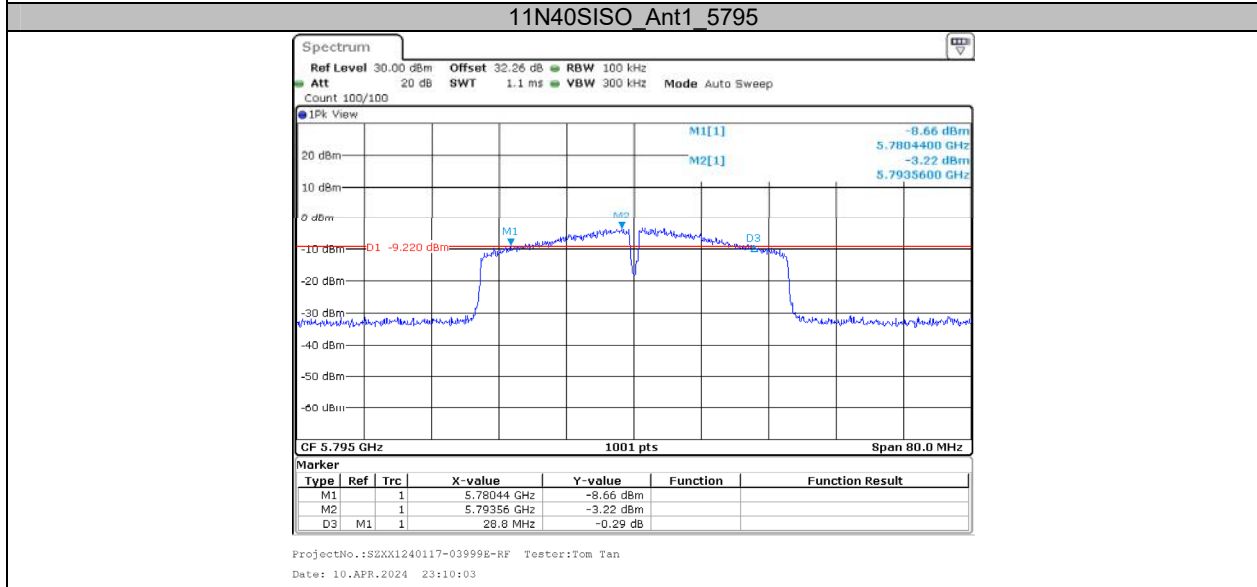
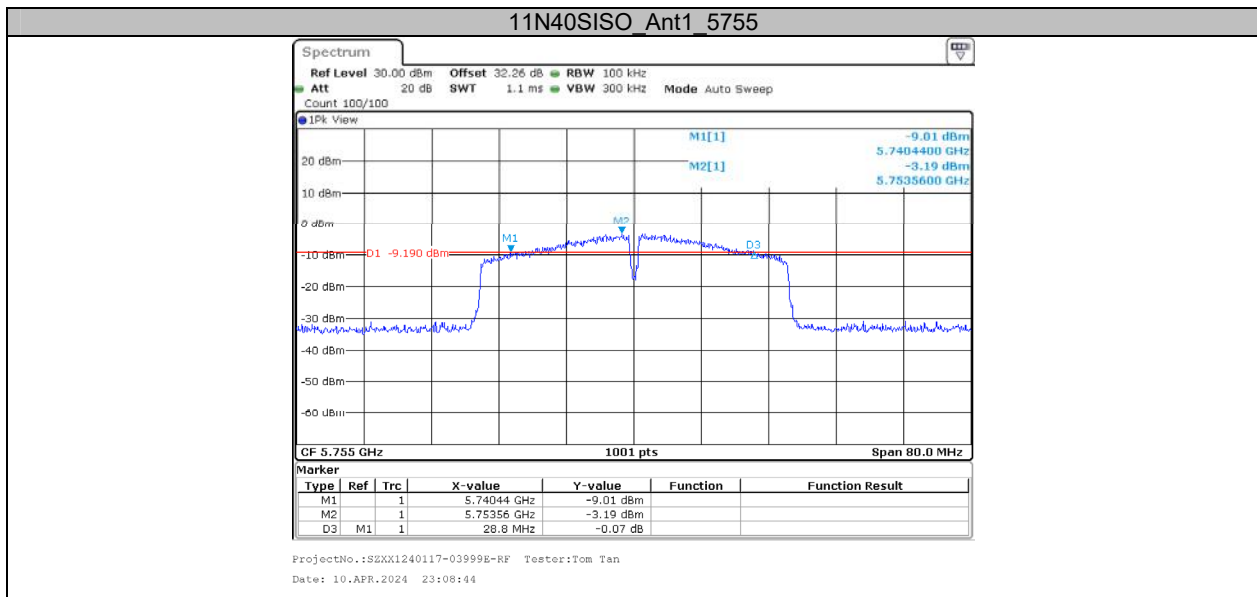
Test Mode	Antenna	Channel	6db EBW [MHz]	Limit[MHz]	Verdict
11A	Ant1	5745	15.92	0.5	PASS
		5785	15.72	0.5	PASS
		5825	15.72	0.5	PASS
11N20SISO	Ant1	5745	15.92	0.5	PASS
		5785	16.28	0.5	PASS
		5825	16.28	0.5	PASS
11N40SISO	Ant1	5755	28.80	0.5	PASS
		5795	28.80	0.5	PASS

Test Graphs









Appendix D: Maximum conducted output power

Test Result

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5260	10.28	≤23.98	PASS
		5280	9.97	≤23.98	PASS
		5320	9.17	≤23.96	PASS
		5500	10.84	≤23.98	PASS
		5580	9.32	≤23.98	PASS
		5700	9.80	≤23.98	PASS
		5745	13.96	≤30.00	PASS
		5785	13.28	≤30.00	PASS
11N20SISO	Ant1	5825	11.98	≤30.00	PASS
		5260	9.41	≤23.98	PASS
		5280	9.43	≤23.98	PASS
		5320	8.62	≤23.98	PASS
		5500	10.04	≤23.98	PASS
		5580	8.59	≤23.98	PASS
		5700	8.80	≤23.98	PASS
		5745	12.04	≤30.00	PASS
11N40SISO	Ant1	5785	12.32	≤30.00	PASS
		5825	11.32	≤30.00	PASS
		5270	10.20	≤23.98	PASS
		5310	9.32	≤23.98	PASS
		5510	11.00	≤23.98	PASS
		5550	10.22	≤23.98	PASS
		5670	10.65	≤23.98	PASS
5755	12.65	≤30.00	PASS		
		5795	13.07	≤30.00	PASS

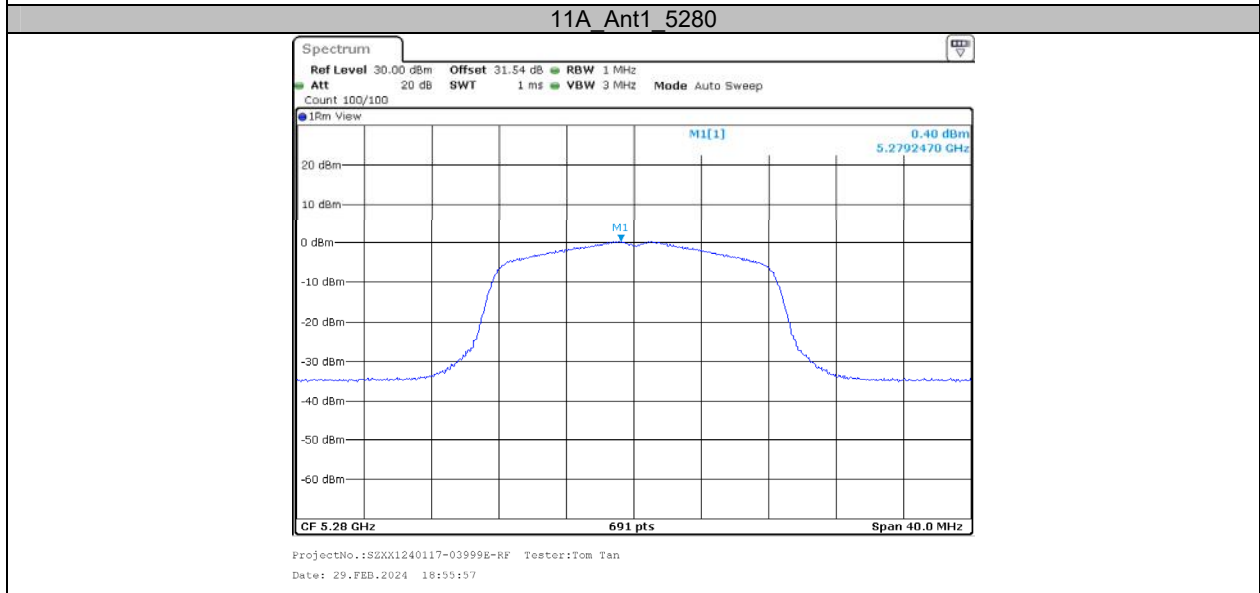
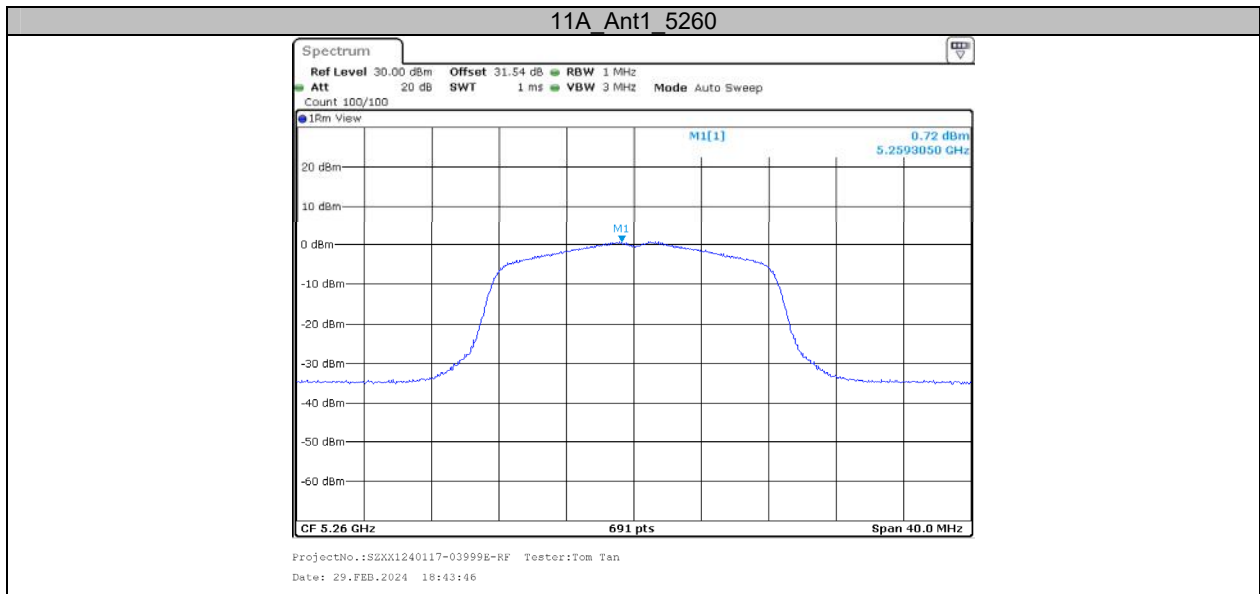
Appendix E: Maximum power spectral density

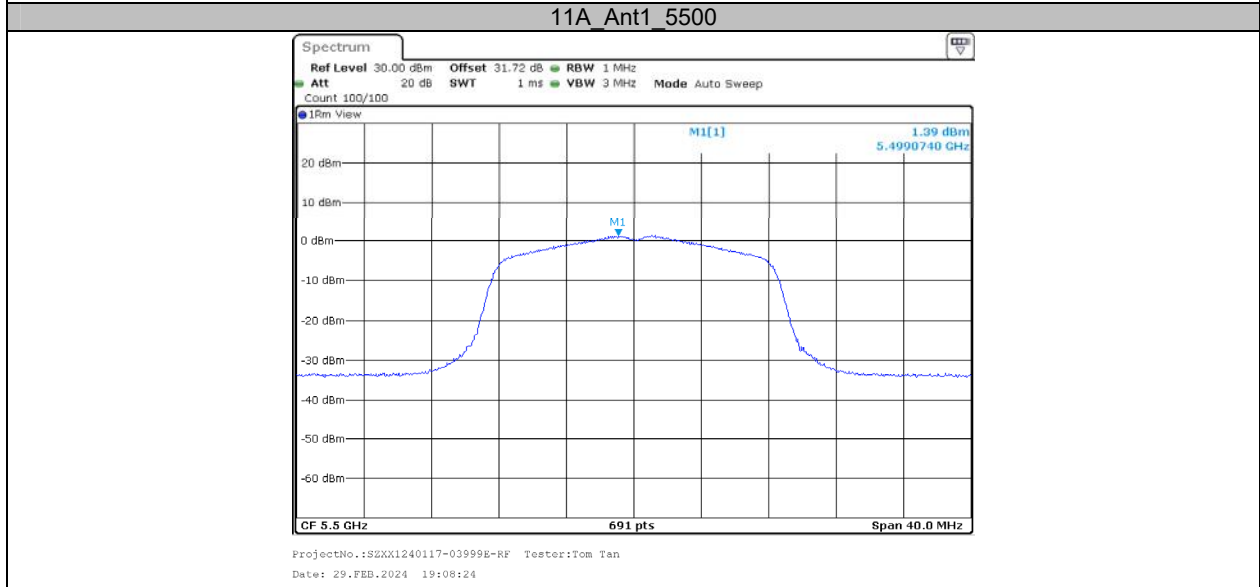
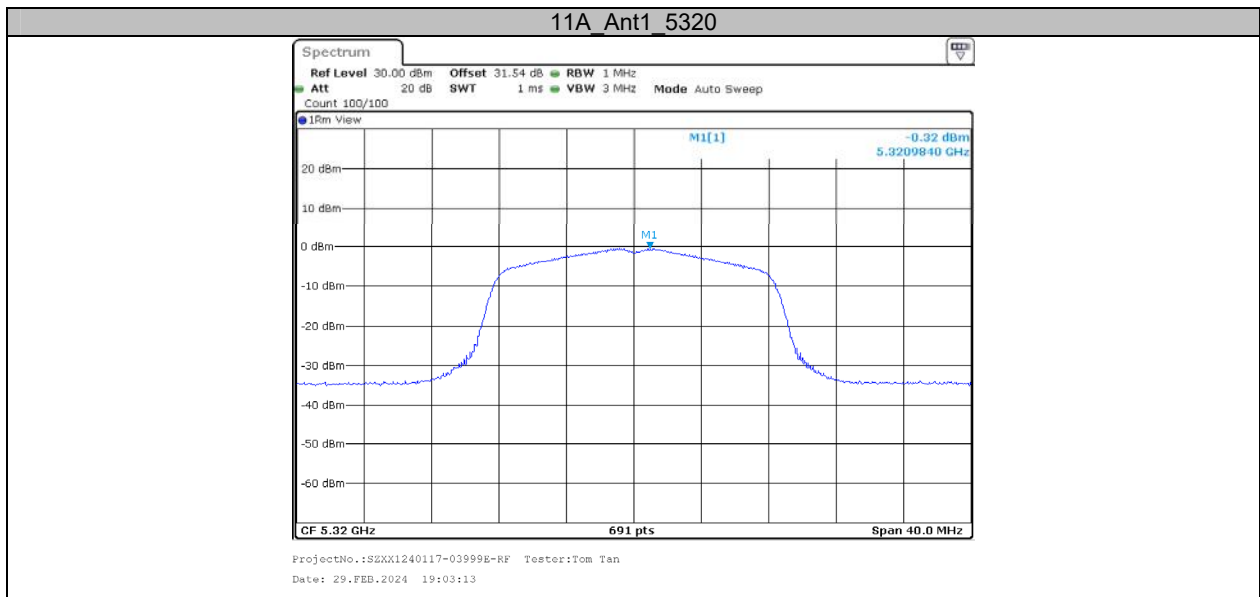
Test Result

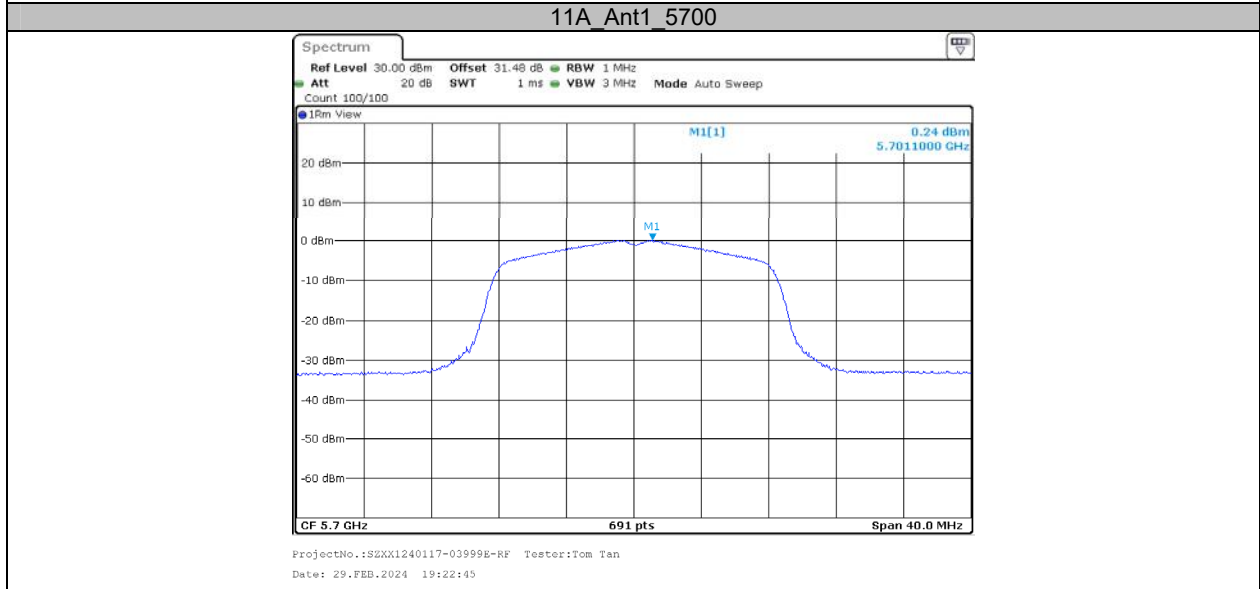
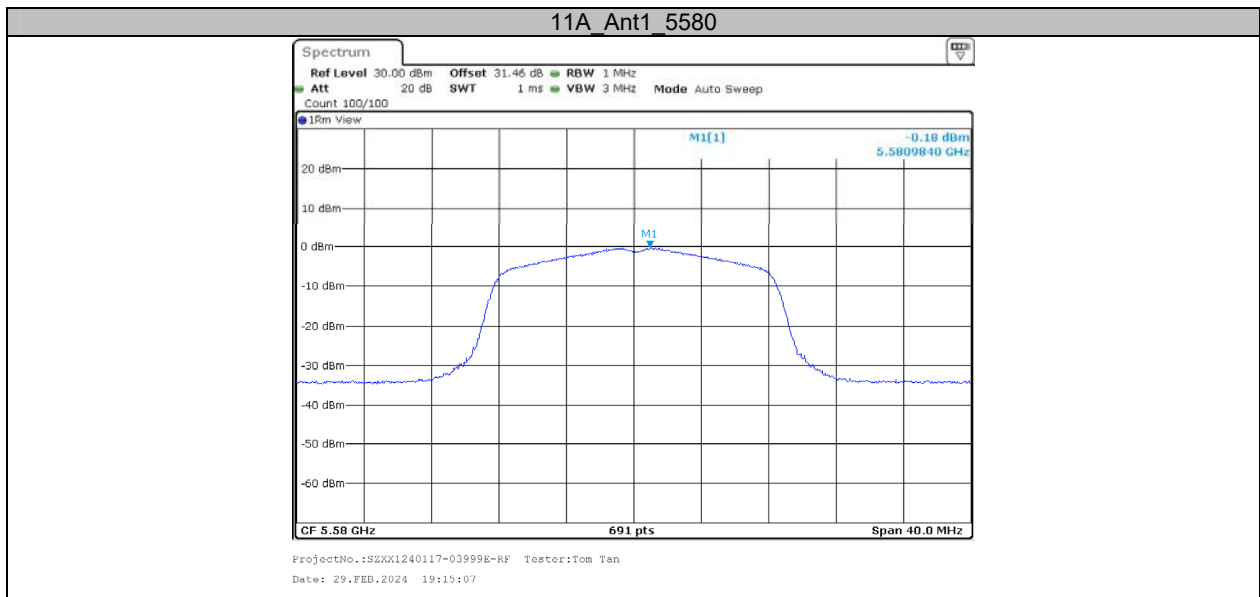
Test Mode	Antenna	Channel	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A	Ant1	5260	0.72	≤11.00	PASS
		5280	0.4	≤11.00	PASS
		5320	-0.32	≤11.00	PASS
		5500	1.39	≤11.00	PASS
		5580	-0.18	≤11.00	PASS
		5700	0.24	≤11.00	PASS
		5745	1.64	≤30.00	PASS
		5785	0.85	≤30.00	PASS
11N20SISO	Ant1	5825	-0.1	≤30.00	PASS
		5260	-0.26	≤11.00	PASS
		5280	-0.22	≤11.00	PASS
		5320	-1.19	≤11.00	PASS
		5500	0.31	≤11.00	PASS
		5580	-1.22	≤11.00	PASS
		5700	-0.92	≤11.00	PASS
		5745	-0.34	≤30.00	PASS
11N40SISO	Ant1	5785	-0.03	≤30.00	PASS
		5825	-1.07	≤30.00	PASS
		5270	-2.12	≤11.00	PASS
		5310	-2.95	≤11.00	PASS
		5510	-1.39	≤11.00	PASS
		5550	-2.08	≤11.00	PASS
		5670	-1.65	≤11.00	PASS
5755	-2.61	≤30.00	PASS		
		5795	-2.23	≤30.00	PASS

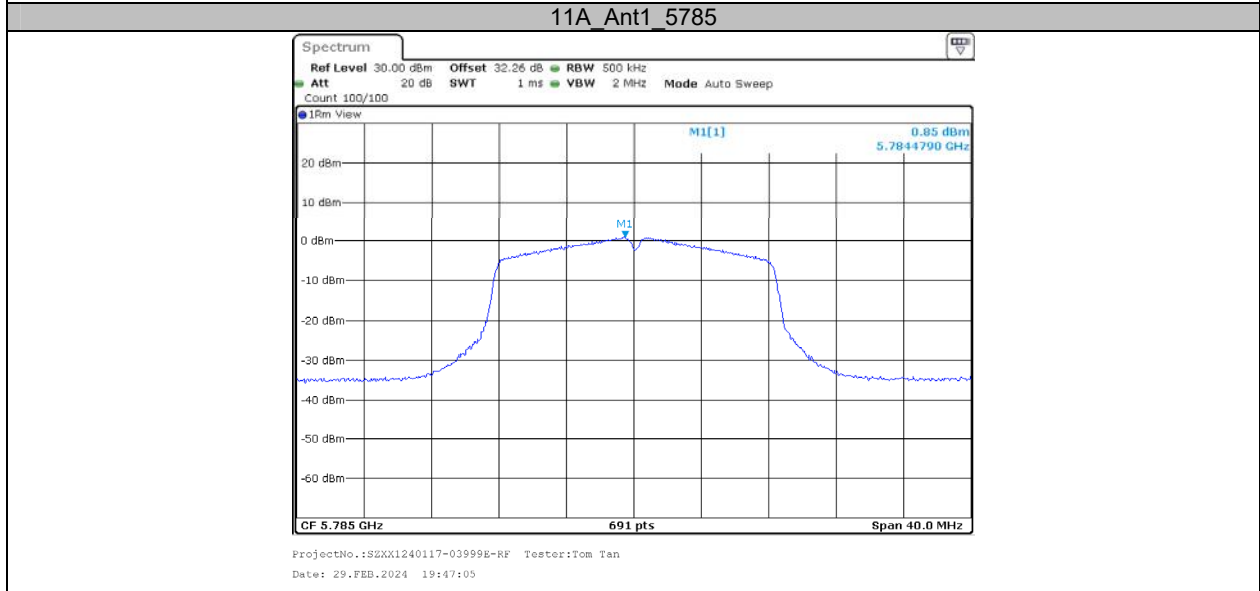
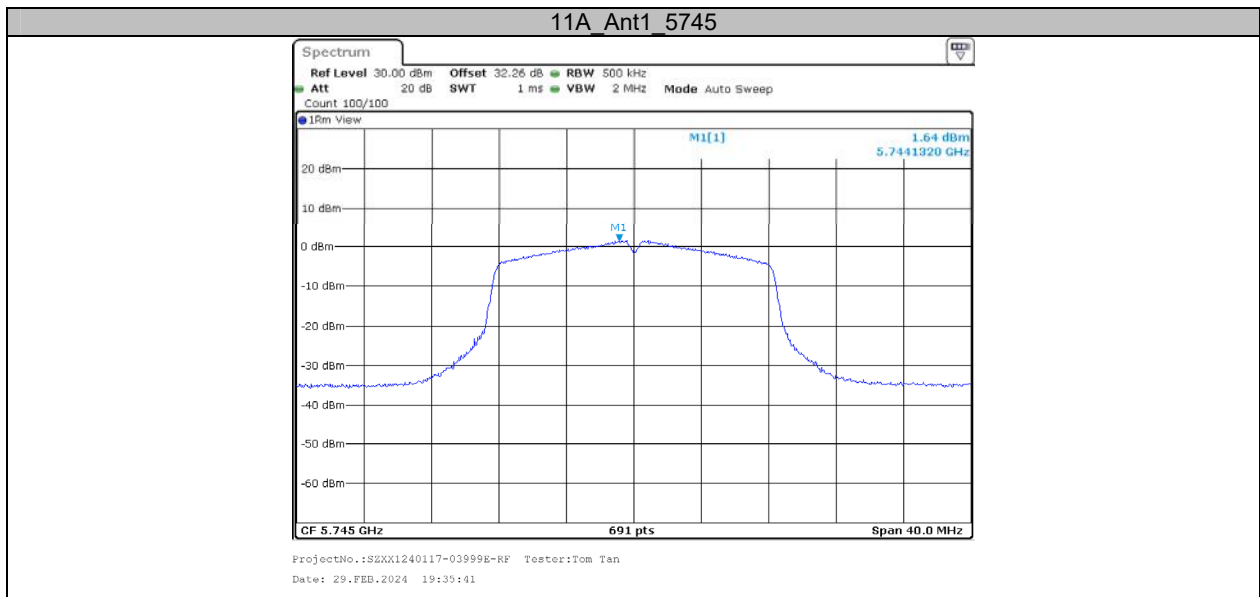
Note: 1. The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.
 2. The Duty Cycle Factor is compensated in the graph.

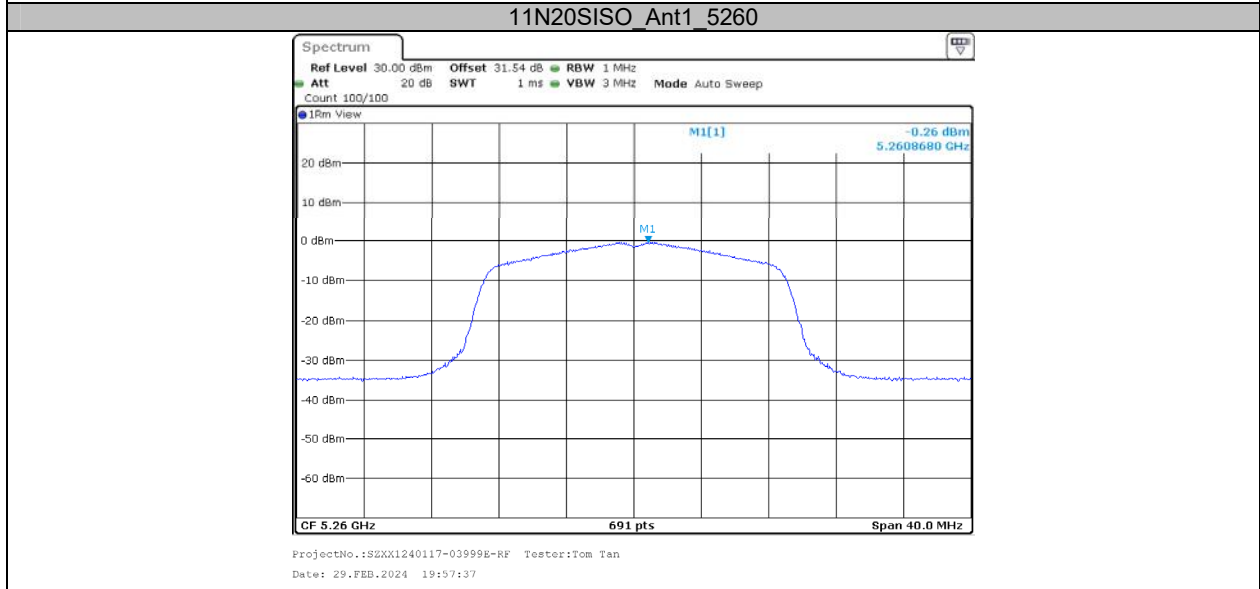
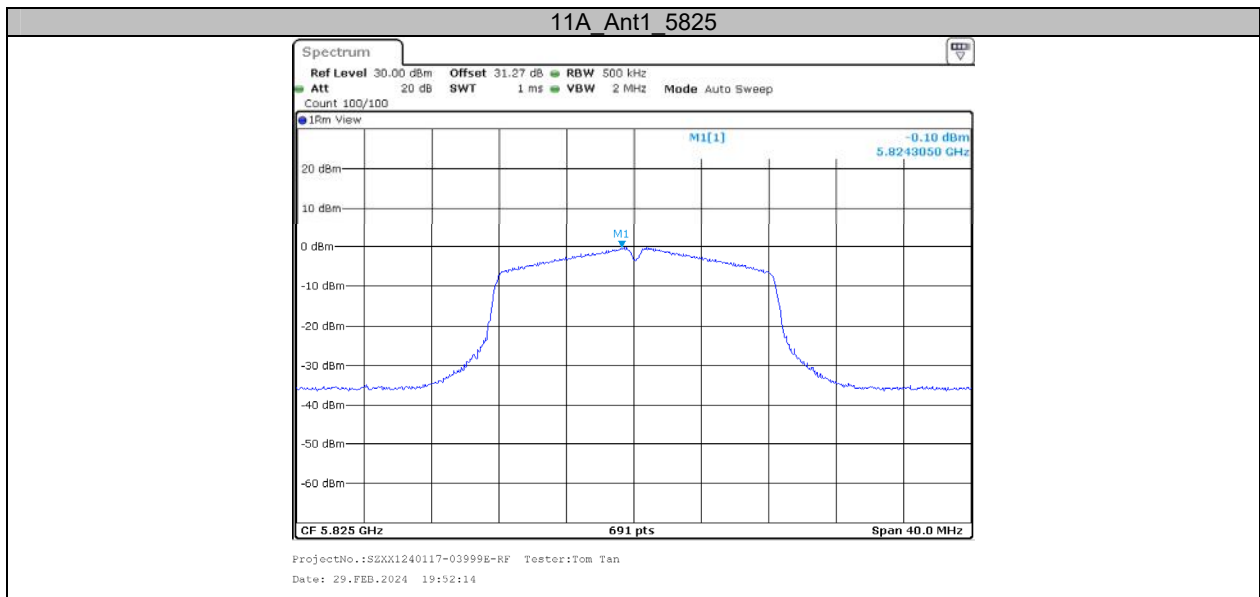
Test Graphs



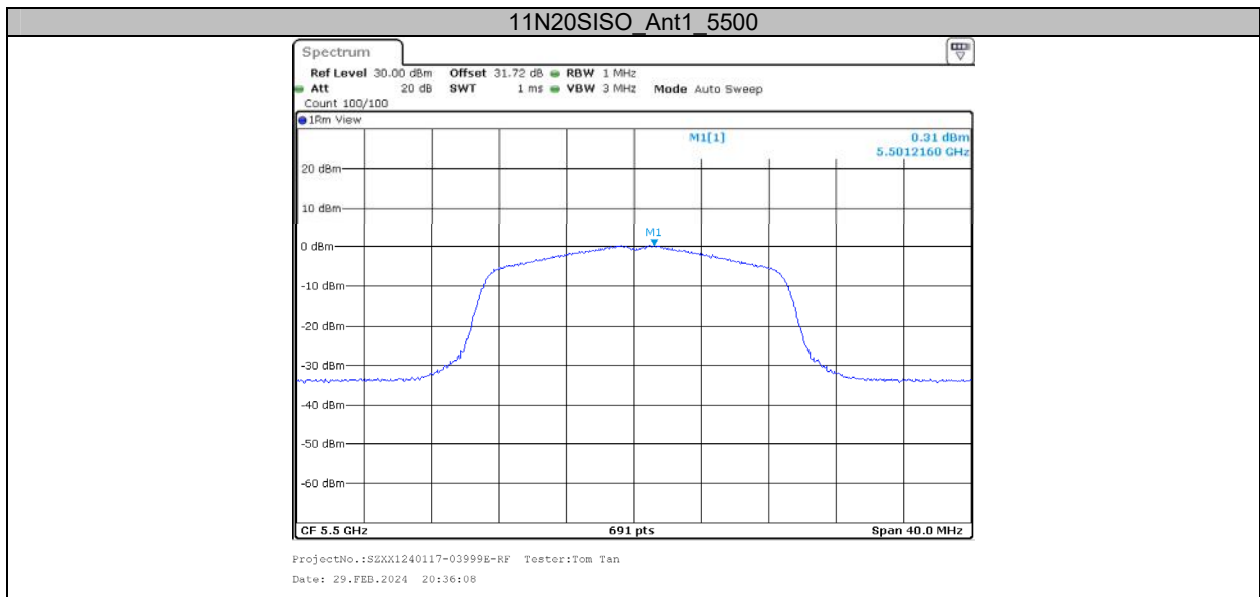


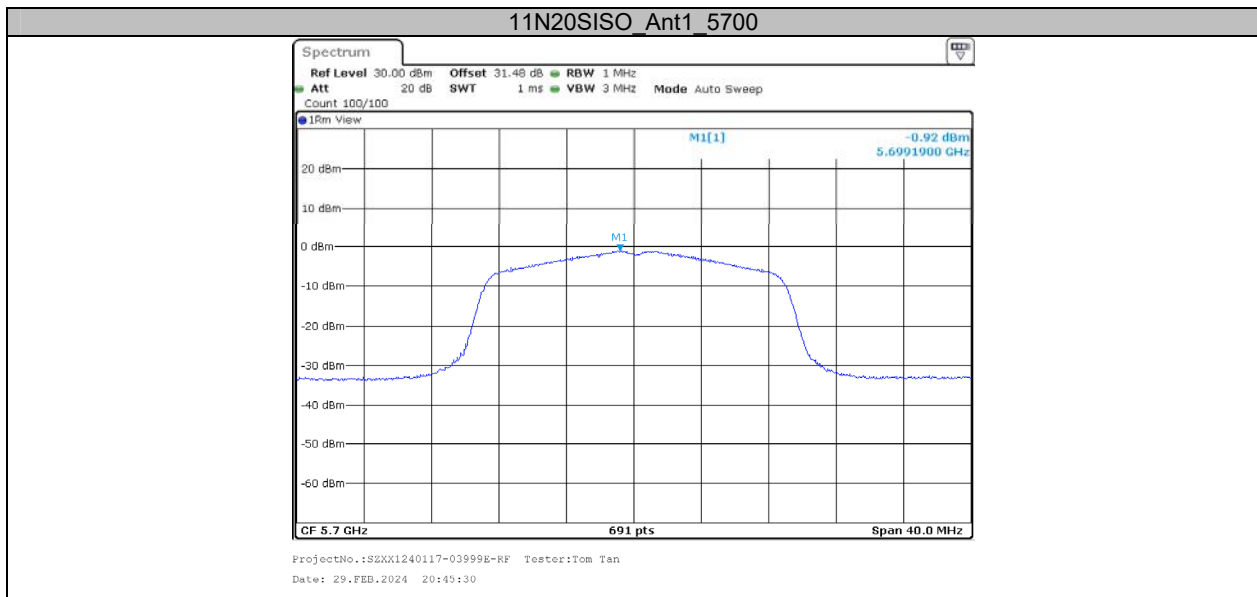


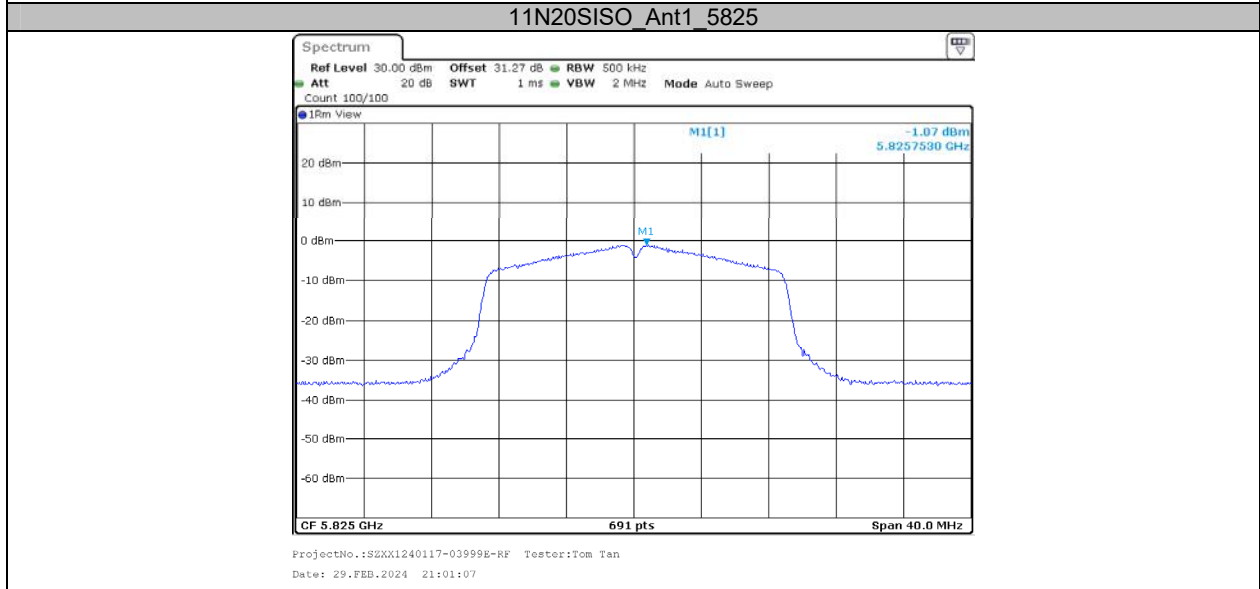


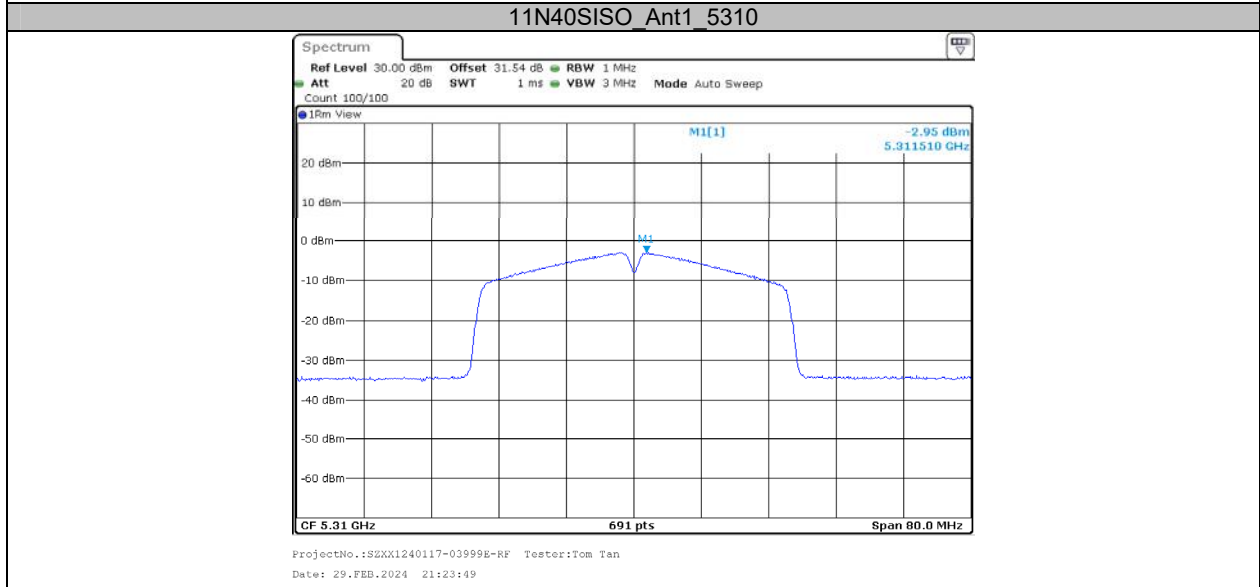
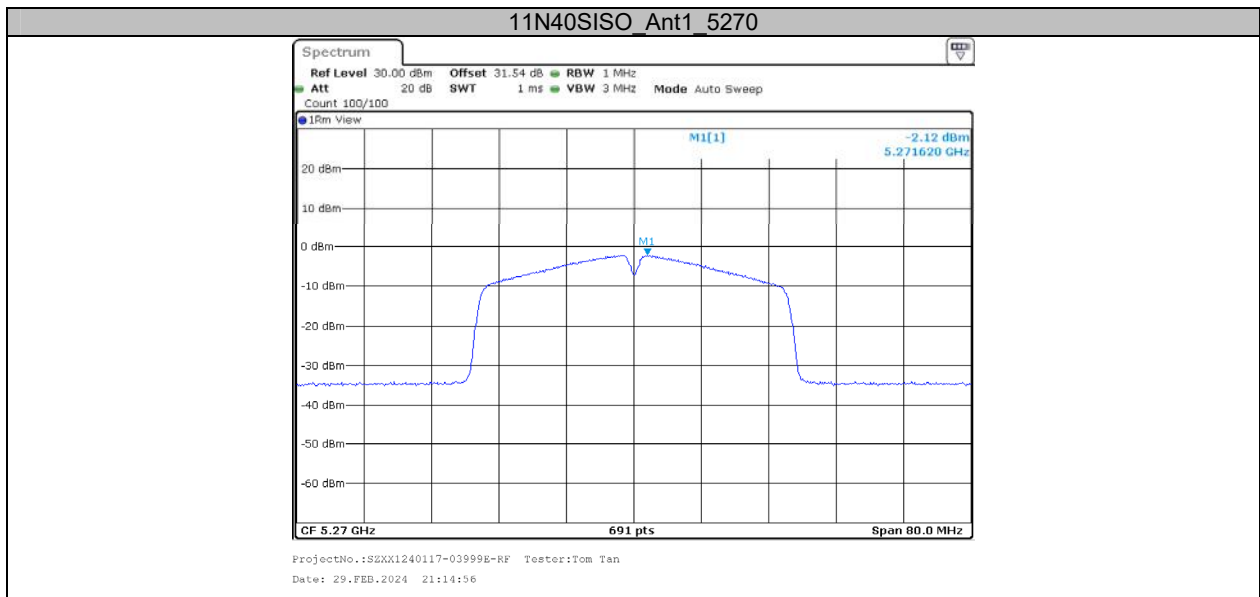


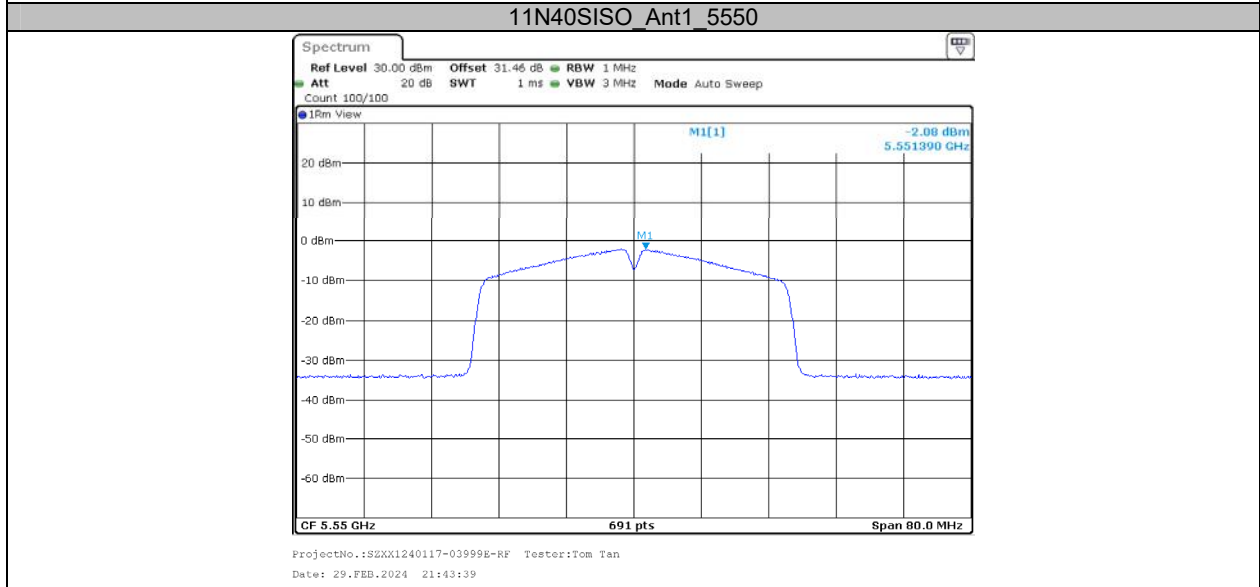
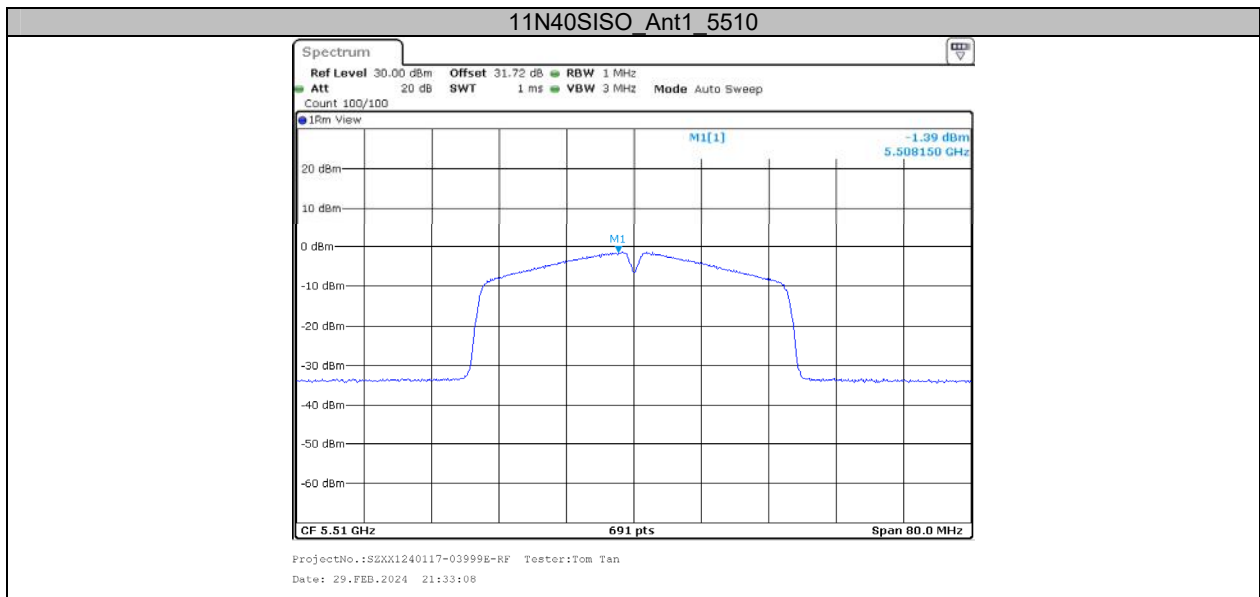


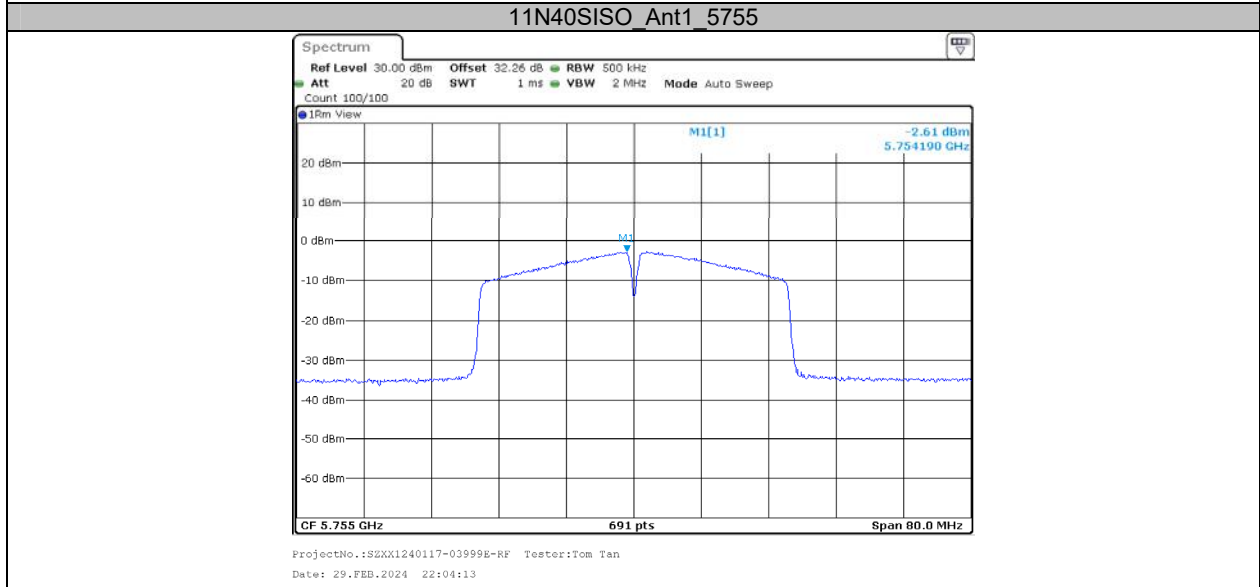
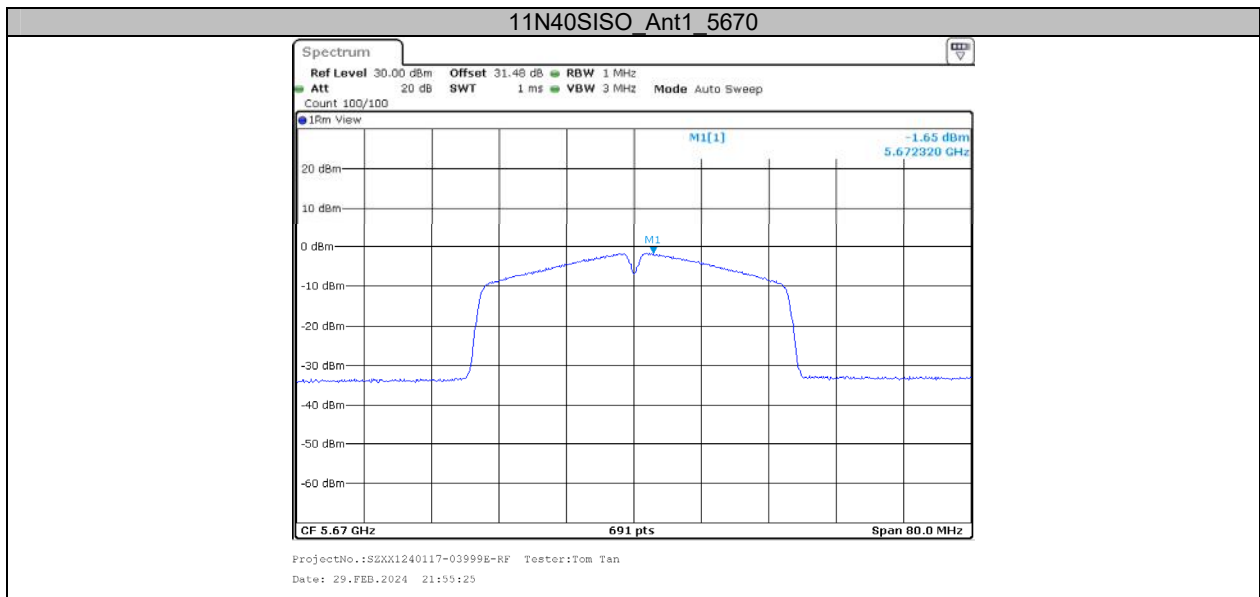


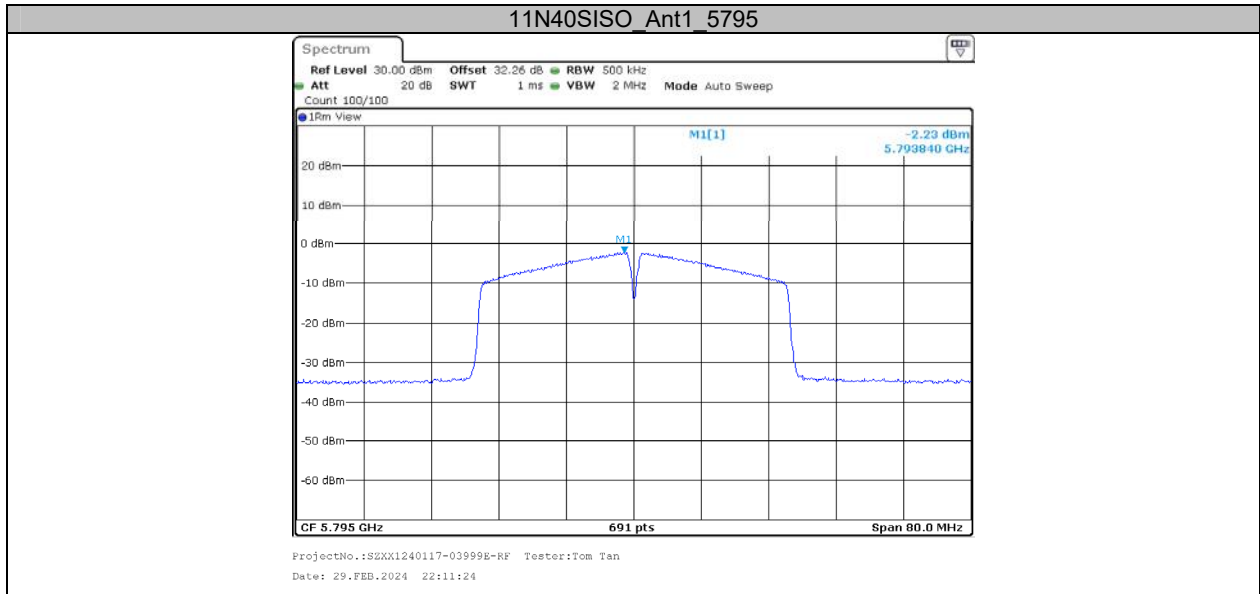










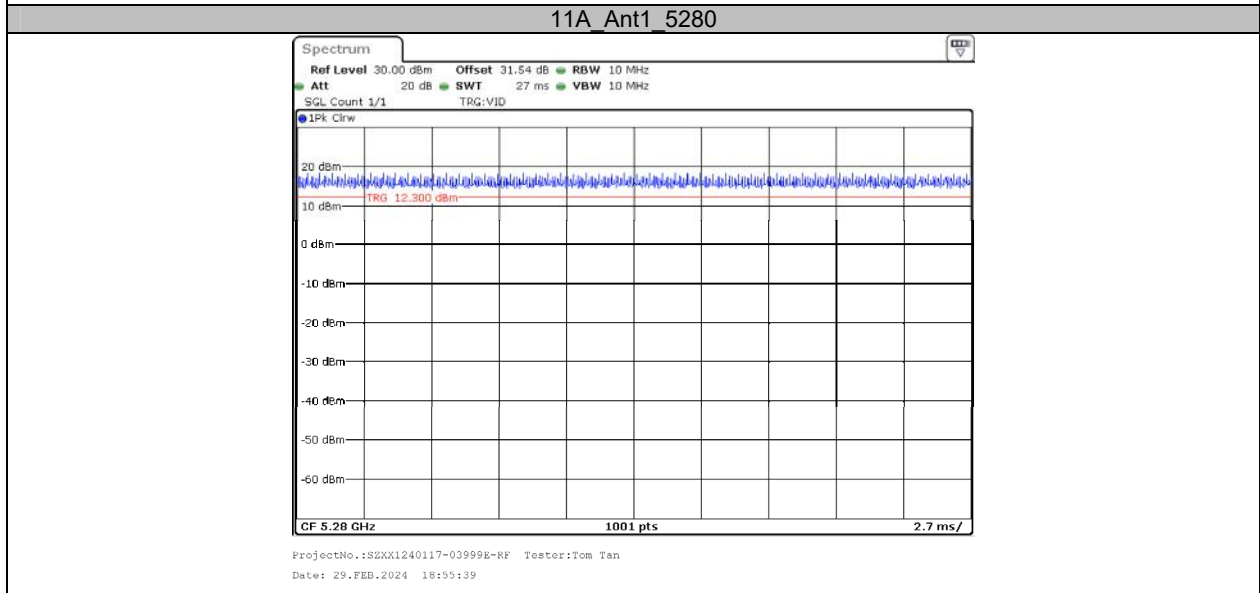
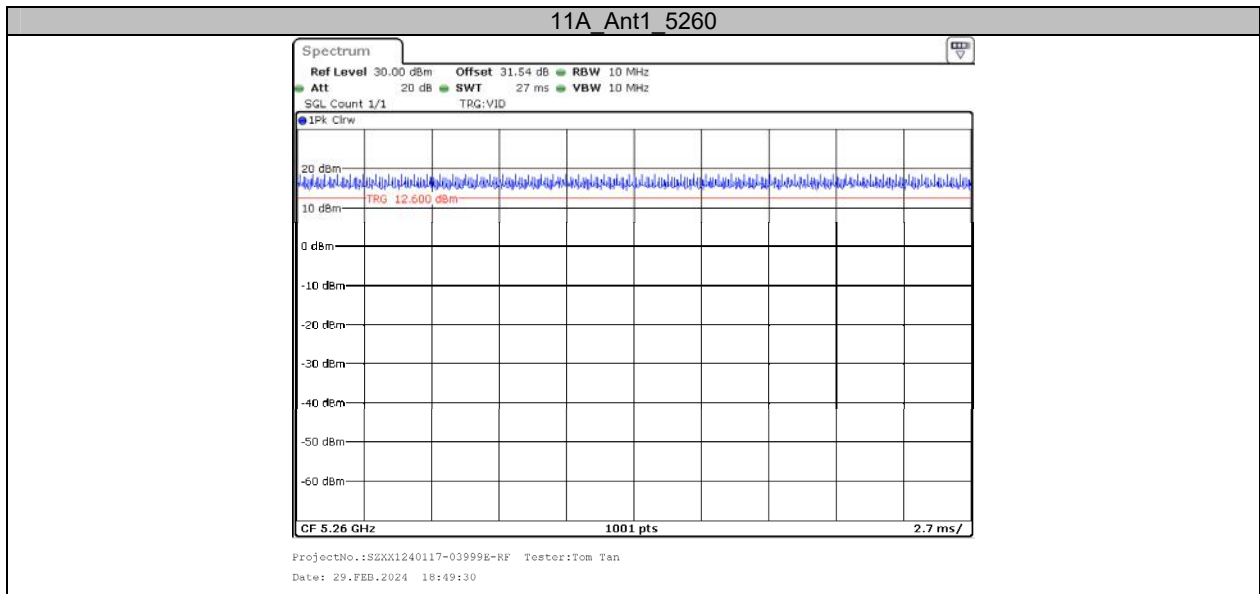


Appendix F: Duty Cycle

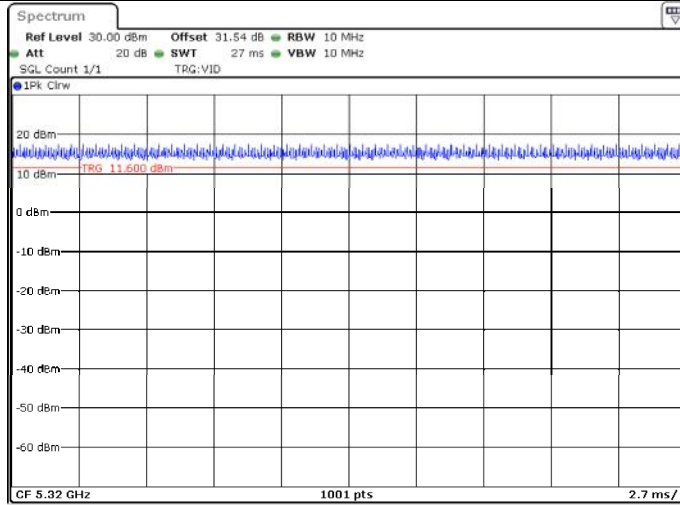
Test Result

Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T (Hz)	VBW Setting (Hz)
11A	Ant1	5260	100.00	100.00	100.00	/	10
		5280	100.00	100.00	100.00	/	10
		5320	100.00	100.00	100.00	/	10
		5500	100.00	100.00	100.00	/	10
		5580	100.00	100.00	100.00	/	10
		5700	100.00	100.00	100.00	/	10
		5745	100.00	100.00	100.00	/	10
		5785	100.00	100.00	100.00	/	10
11N20SISO	Ant1	5825	100.00	100.00	100.00	/	10
		5260	100.00	100.00	100.00	/	10
		5280	100.00	100.00	100.00	/	10
		5320	100.00	100.00	100.00	/	10
		5500	100.00	100.00	100.00	/	10
		5580	100.00	100.00	100.00	/	10
		5700	100.00	100.00	100.00	/	10
		5745	100.00	100.00	100.00	/	10
11N40SISO	Ant1	5785	100.00	100.00	100.00	/	10
		5825	100.00	100.00	100.00	/	10
		5270	100.00	100.00	100.00	/	10
		5310	100.00	100.00	100.00	/	10
		5510	100.00	100.00	100.00	/	10
		5550	100.00	100.00	100.00	/	10
	Ant1	5670	100.00	100.00	100.00	/	10
		5755	100.00	100.00	100.00	/	10
		5795	100.00	100.00	100.00	/	10

Test Graphs

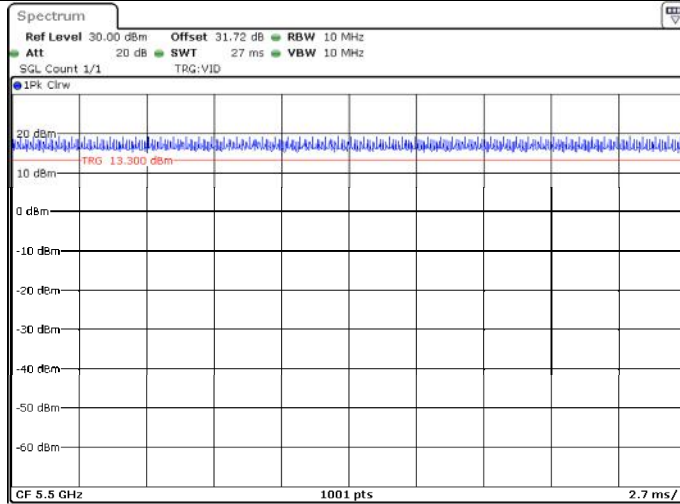


11A_Ant1_5320



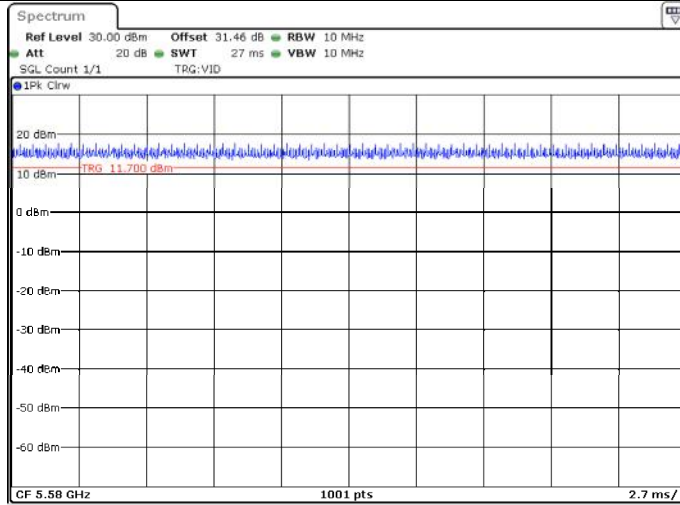
ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
Date: 29.FEB.2024 19:02:55

11A_Ant1_5500



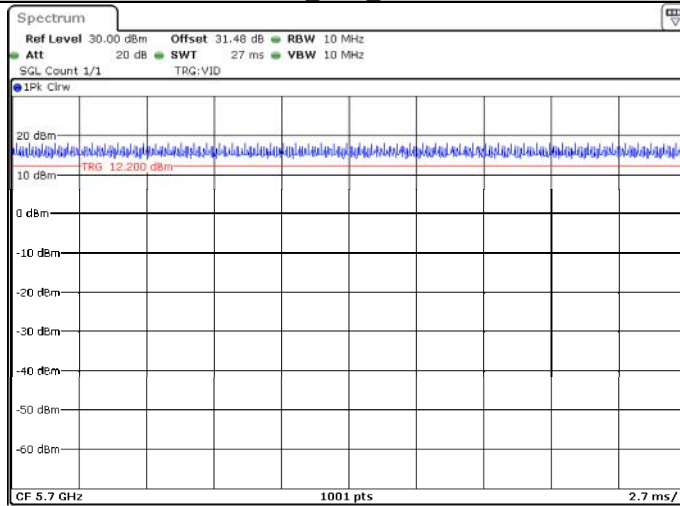
ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
Date: 29.FEB.2024 19:08:06

11A_Ant1_5580



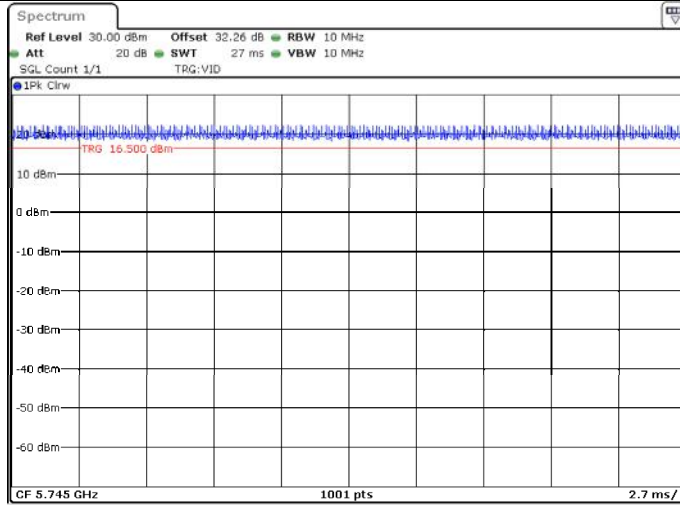
ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
Date: 29.FEB.2024 19:14:49

11A_Ant1_5700



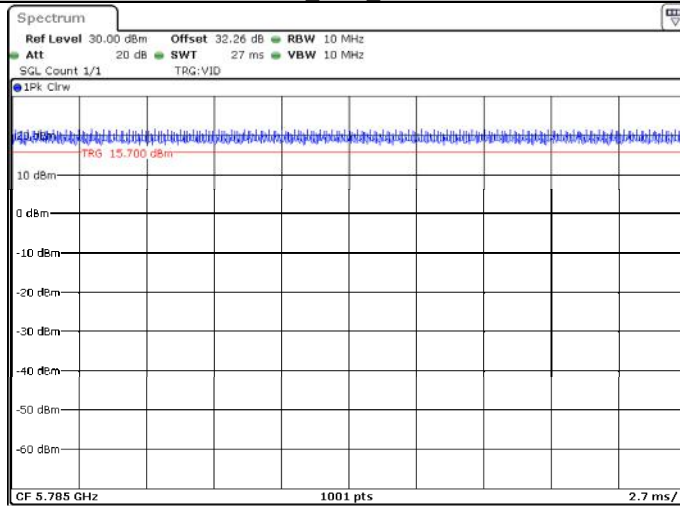
ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
Date: 29.FEB.2024 19:22:27

11A_Ant1_5745



ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
Date: 29.FEB.2024 19:35:22

11A_Ant1_5785



ProjectNo.:SZXX1240117-03999E-RF Tester:Tom Tan
Date: 29.FEB.2024 19:46:45

