

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART E REQUIREMENT**

TEST REPORT

For

10.3-INCH reader

Model No.: SHERD-01-9BA, SHERD-0X-9BA

(X indicates the serial number from 1 to 10000, and B indicates color A to Z)

FCC ID: 2A9YMSHERD-01

Trade Mark: N/A

Report No.: E01A23010214F00103

Issue Date: February 22, 2023

Prepared for

Guangdong SID Technology CO.,LTD

**Room 101, Building 5, No. 21, Dongke Road, Dongcheng Street,
Dongguan City, Guangdong**

Prepared by

**Dong Guan Anci Electronic Technology Co., Ltd.
1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake
Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr.,
China.**

**This report shall not be reproduced, except in full, without the written approval of
Dong Guan Anci Electronic Technology Co., Ltd.**

1 TEST RESULT CERTIFICATION

Applicant:	Guangdong SID Technology CO.,LTD Room 101, Building 5, No. 21, Dongke Road, Dongcheng Street, Dongguan City, Guangdong
Manufacturer:	Guangdong SID Technology CO.,LTD Room 101, Building 5, No. 21, Dongke Road, Dongcheng Street, Dongguan City, Guangdong
Product Description:	10.3-INCH reader
Model Number:	SHERD-01-9BA, SHERD-0X-9BA (X indicates the serial number from 1 to 10000, and B indicates color A to Z) (All models are the same except for the model name and color of appearance, we choose model: SHERD-01-9BA for all tests.)
Sample number:	A23010214 003

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart E	PASS

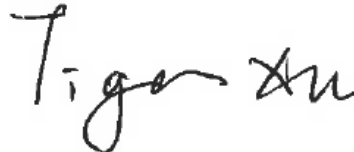
The above equipment was tested by Dong Guan Anci Electronic Technology Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.407
The test results of this report relate only to the tested sample identified in this report.

Date of Test : January 07, 2023 to February 20, 2023



Prepared by :

Duke Liu/Editor



Reviewer & Authorized
Signer :

Tiger Xu/ Supervisor

TABLE OF CONTENTS

1	TEST RESULT CERTIFICATION	1
2	EUT TECHNICAL DESCRIPTION.....	3
3	SUMMARY OF TEST RESULT	4
4	TEST METHODOLOGY.....	5
4.1	GENERAL DESCRIPTION OF APPLIED STANDARDS	5
4.2	MEASUREMENT EQUIPMENT USED	5
4.3	DESCRIPTION OF TEST MODES.....	7
5	FACILITIES AND ACCREDITATIONS.....	65
5.1	FACILITIES	65
5.2	LABORATORY ACCREDITATIONS AND LISTINGS	65
6	TEST SYSTEM UNCERTAINTY	66
7	SETUP OF EQUIPMENT UNDER TEST	67
7.1	RADIO FREQUENCY TEST SETUP.....	67
7.2	RADIO FREQUENCY TEST SETUP.....	67
7.3	CONDUCTED EMISSION TEST SETUP	69
7.4	BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM	70
7.5	SUPPORT EQUIPMENT	70
8	TEST REQUIREMENTS	71
8.1	BANDWIDTH MEASUREMENT.....	71
8.2	MAXIMUM CONDUCTED OUTPUT POWER.....	85
8.3	MAXIMUM PEAK POWER DENSITY	87
8.4	FREQUENCY STABILITY	97
8.5	UNDESIRABLE RADIATED SPURIOUS EMISSION.....	70
8.6	POWER LINE CONDUCTED EMISSIONS.....	93
8.7	ANTENNA APPLICATION	96

2 EUT TECHNICAL DESCRIPTION

Characteristics	Description			
IEEE 802.11 WLAN Mode Supported	802.11a(20MHz channel bandwidth) 802.11b(20MHz channel bandwidth) 802.11g(20MHz channel bandwidth) 802.11n(20MHz channel bandwidth)			
Data Rate	WIFI: 802.11 b:1,2,5.5,11Mbps; 802.11 g/a:6,9,12,18,24,36,48,54Mbps; 802.11n(HT20): MCS0-MCS15;			
Modulation	WIFI: OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/g/n; DSSS with DBPSK/DQPSK/CCK for 802.11b;			
Operating Frequency Range	WIFI 5G Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)	5180-5240	4
	UNII Band III	802.11a/n(HT20)	5745-5825	5
	2.4G WIFI: 2412-2462MHz for 802.11b/g; 2412-2462MHz for 802.11n(HT20); 2422-2452MHz for 802.11n(HT40);			
Transmit Power Max	6.25 dBm for WIFI 2.4G Band; 6.23 dBm for UNII Band I; 5.92 dBm for UNII Band III			
Antenna Type	Internal antenna			
Max Antenna Gain	2.14 dBi for WIFI 2.4 Band 2.04 dBi for WIFI 5G Band I 2.04 dBi for WIFI 5G Band III			
Power Supply	DC 5V, 2A			
Test Power Supply	DC 5V from adapter and Battery 3.8V			
Sample receipt date	January 07, 2023			

Note: for more details, please refer to the User's manual of the EUT.

3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.407 (a) 15.407 (e)	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (a)	Maximum Conducted Output Power	PASS	
15.407 (a)	Peak Power Spectral Density	PASS	
15.407 (b)	Radiated Spurious Emission	PASS	
15.407(g)	Frequency Stability	PASS	
15.407 (b)(6) 15.207	Power Line Conducted Emission	PASS	
15.407(a) 15.203	Antenna Application	PASS	
NOTE1: N/A (Not Applicable) NOTE2: According to FCC OET KDB 789033 D2 General UNII Test Procedures New Rules v01r03, In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2A9YMSHERD-01 filing to comply with Section 15.247 of the FCC Part 15, Subpart E Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart E

FCC KDB 789003 D2 General UNII Test Procedures New Rules v01r03

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 662911 D02 MIMO With Cross Polarized Antenna V01

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
LISN	ROHDE&SCHWARZ	ENV216	101413	2023-10-07
RF Cable	N/A	ZT06S-NJ-NJ-2.5M	19044022	2023-05-12
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101358	2023-05-12
1# Shielded Room	chengyu	8m*4m*3.3m	N/A	2025-11-21
Test Software	Farad	EZ-EMC (Ver.ANCI-3A1)	N/A	N/A

4.2.2 Radiated Emission Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
EMI Test Receiver	Rohde & Schwarz	ESPI7	100502	2023-10-07
Pre-Amplifier	Anritsu	MH648A	M57886	2023-05-12
Bilog Antenna	Schwarzbeck	VULB9163	VULB9163-1290	2023-12-11
RF Cable	N/A	ZT06S-NJ-NJ-11M	19060398	2023-05-12
RF Cable	N/A	ZT06S-NJ-NJ-0.5M	19060400	2023-05-12
RF Cable	N/A	ZT06S-NJ-NJ-2.5M	19060404	2023-05-12
Spectrum Analyzer	Rohde & Schwarz	FSV40	101413	2023-10-07
Low noise Amplifiers	A-INFO	LA1018N4009	J1013130524001	2023-05-12
Horn antenna	A-INFO	LB-10180-SF	J2031090612123	2024-05-14
RF Cable	N/A	ZT26-NJ-NJ-11M	19060401	2023-05-12
RF Cable	N/A	ZT26-NJ-NJ-2.5M	19060402	2023-05-12
RF Cable	N/A	ZT26-NJ-NJ-0.5M	19060403	2023-05-12
3m Semi-anechoic Chamber	chengyu	9m*6m*6m	N/A	2024-11-12
Test Software	Farad	EZ-EMC (Ver.FA-03A2 RE)	N/A	N/A

4.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	Calibrated until
Spectrum Analyzer	Rohde & Schwarz	FSV40	US40240623	2023-10-07
RF Test Software	MWRF-test	MTS 8310	N/A	N/A
Radio Frequency control box	MWRF-test	MW200-RFCB	MW220111ANCI	2023-05-12
USB RF Power sensor	RadiPower	RPR3006W	17I00015SNO88	2023-10-07

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (☒802.11a: 6 Mbps; ☒802.11n (HT20): MCS0; ☒802.11n (HT20): MCS15) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

☒ Wifi 5G with UNII Band I

Frequency and Channel list for 802.11a/n(HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

Test Frequency and Channel for 802.11a/n(HT20)

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

☒ Wifi 5G with UNII Band III

Frequency and Channel list for 802.11a/n(HT20)

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805		

Test Frequency and Channel for 802.11a/n(HT20)

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr., China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.	: Accredited by FCC, May 30, 2019 Designation Number: CN1230 Test Firm Registration Number: 991798
Name of Firm	: Dong Guan Anci Electronic Technology Co., Ltd. 1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr., China.

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

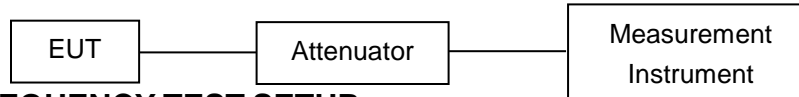
Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0\text{dB}$
Conducted Emissions Test	$\pm 2.0\text{dB}$
Radiated Emission Test	$\pm 2.0\text{dB}$
Power Density	$\pm 2.0\text{dB}$
Occupied Bandwidth Test	$\pm 1.0\text{dB}$
Band Edge Test	$\pm 3\text{dB}$
All emission, radiated	$\pm 3\text{dB}$
Antenna Port Emission	$\pm 3\text{dB}$
Temperature	$\pm 0.5^{\circ}\text{C}$
Humidity	$\pm 3\%$

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

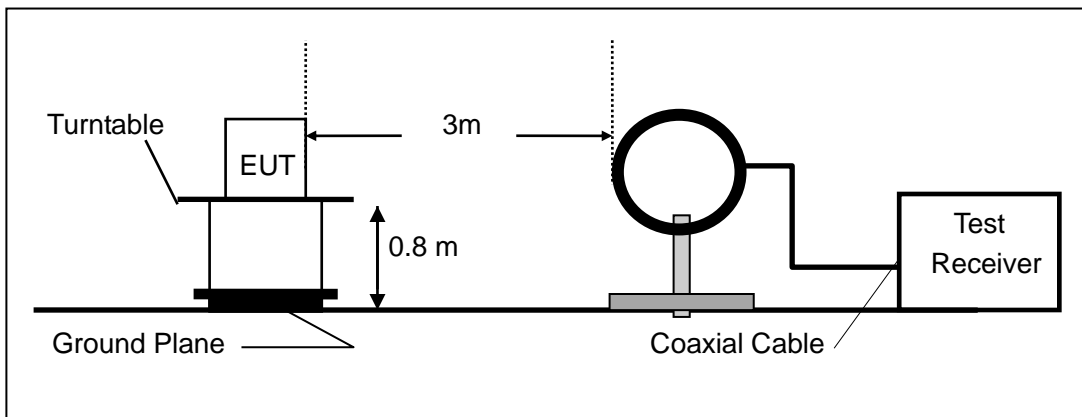
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

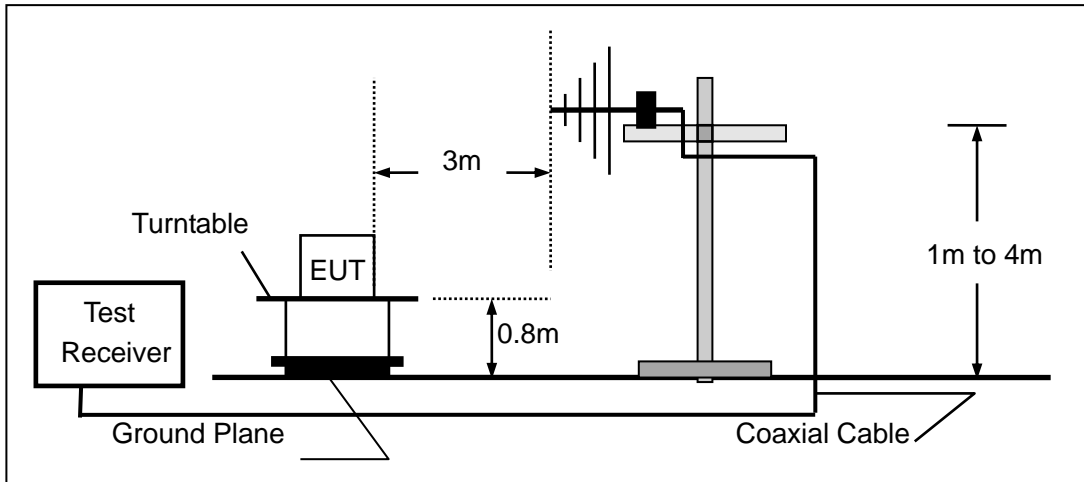
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

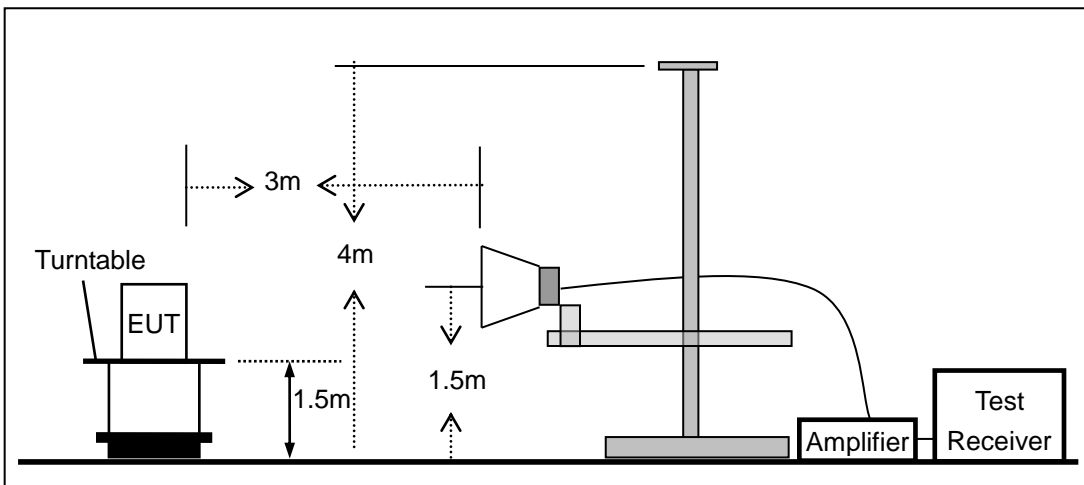
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

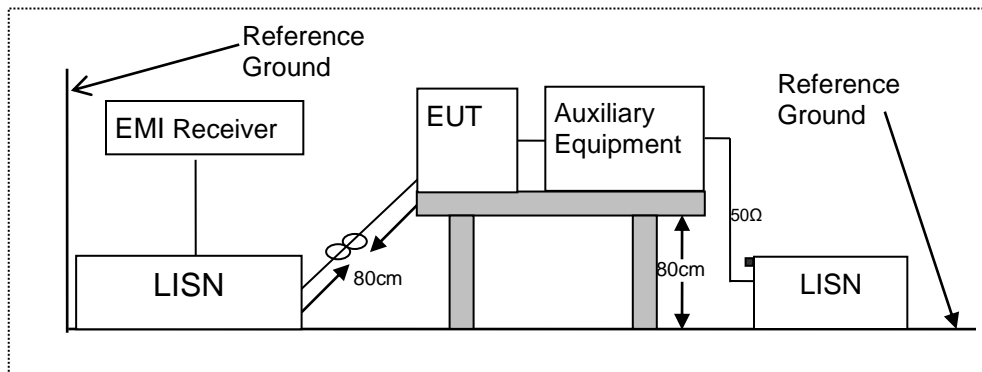


7.3 CONDUCTED EMISSION TEST SETUP

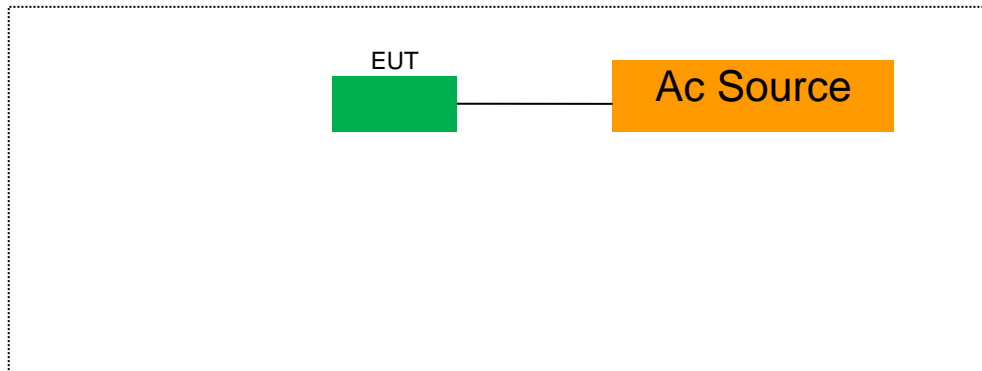
The mains cable of the EUT must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 TEST REQUIREMENTS

8.1 BANDWIDTH MEASUREMENT

8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I
According to FCC Part 15.407(e) for UNII Band III

8.1.2 Conformance Limit

No limit requirement.

The minimum 6 dB emission bandwidth of at least 500 KHz for the UNII Band III.

8.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.1.4 Test Procedure

Connect the antenna port(s) to the spectrum analyzer input. Using the spectrum analyzer Channel Bandwidth mode, configure the spectrum analyzer as shown below

■ The following procedure shall be used for measuring (26 dB) power bandwidth:

Center Frequency: test Frequency

Set RBW = approximately 1% of the emission bandwidth.

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

X dB Bandwidth: 26 dB

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%.

■ Minimum Emission Bandwidth for the UNII Band III

Center Frequency: test Frequency

Set RBW = 100 kHz

Set VBW $\geq 3 \cdot$ RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

X dB Bandwidth: 6 dB

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

■ The following procedure shall be used for measuring (99 %) power bandwidth:

Set center frequency to the nominal EUT channel center frequency.

Set span = 1.5 times to 5.0 times the OBW.

Set RBW = 1 % to 5 % of the OBW

Set VBW $\geq 3 \cdot$ RBW

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.

Use the 99 % power bandwidth function of the instrument (if available).

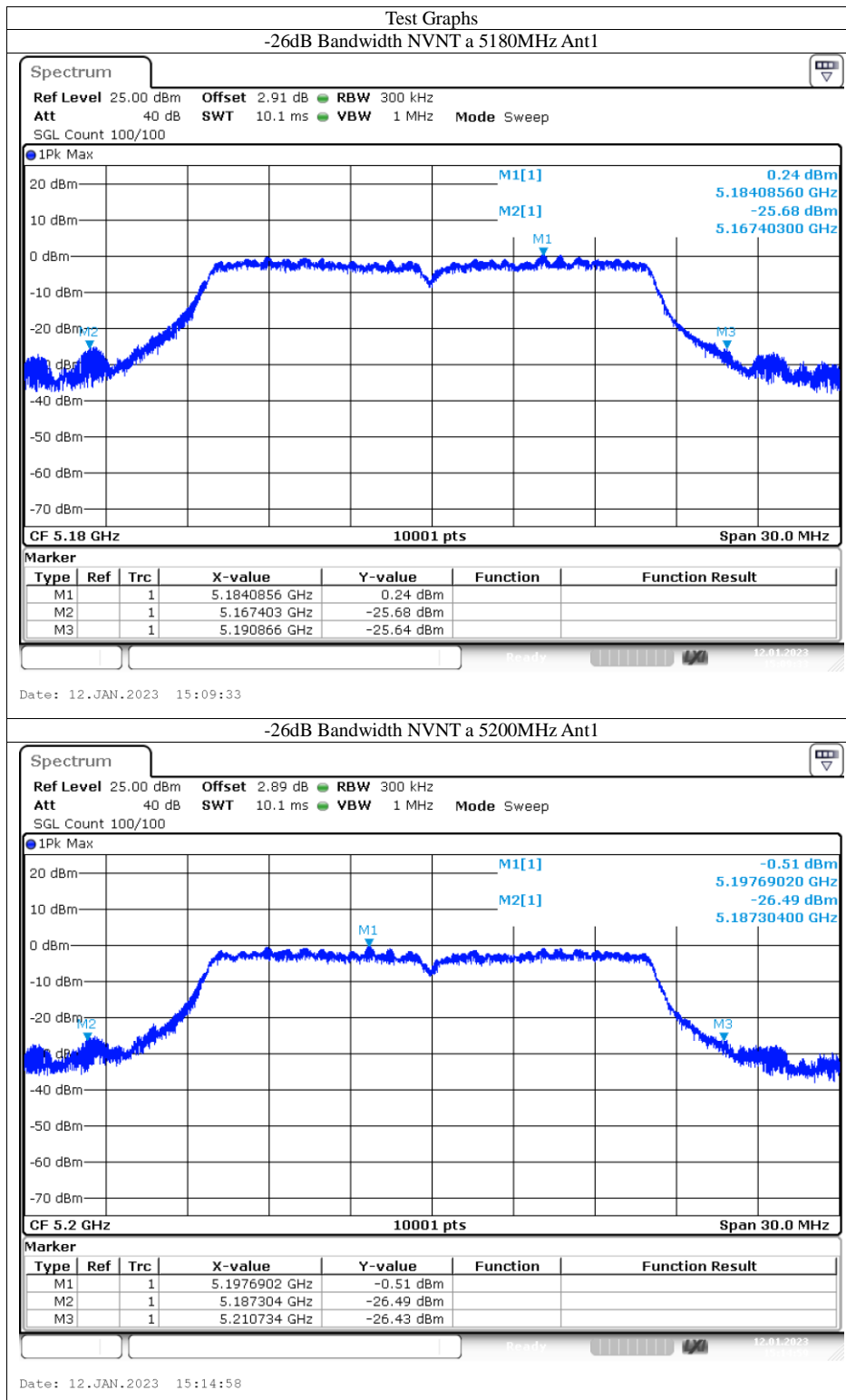
If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded 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% occupied bandwidth is the difference between these two frequencies.

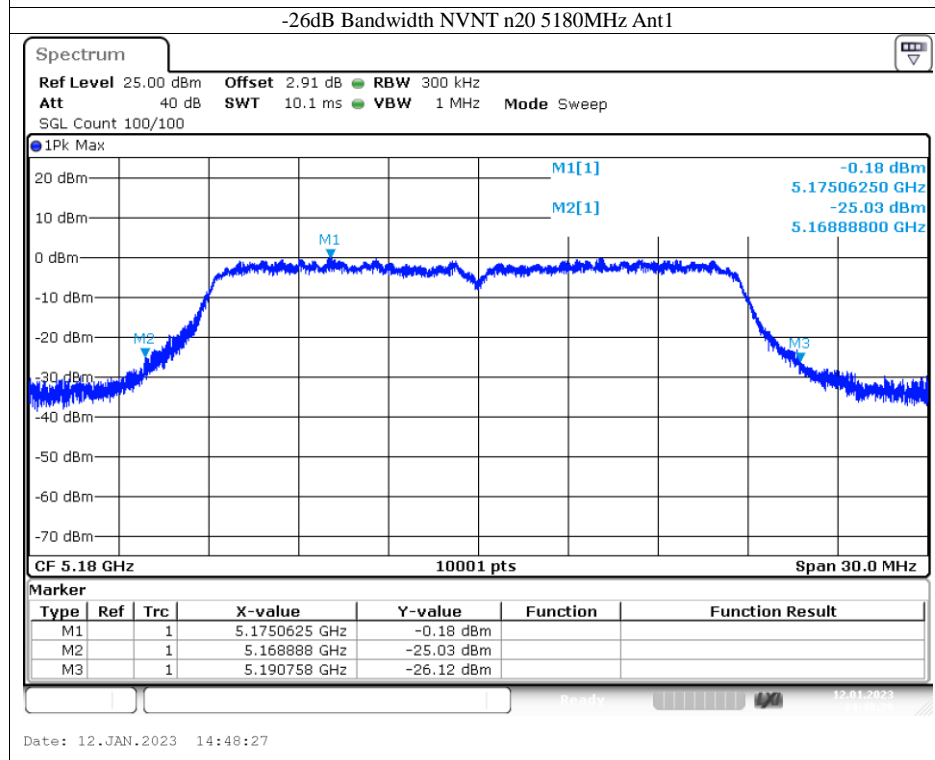
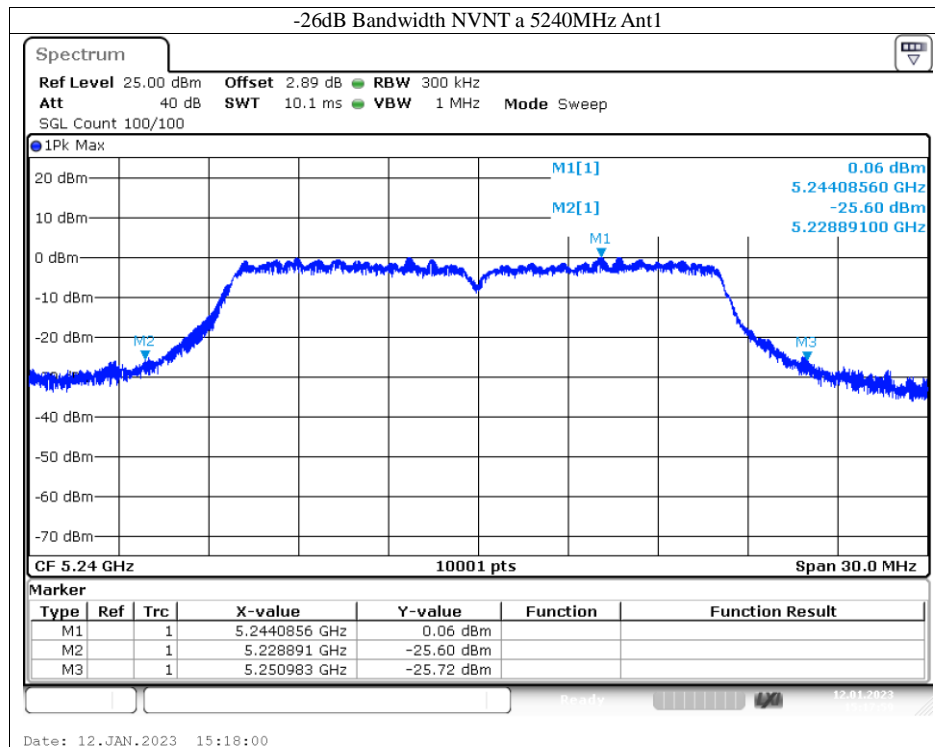
8.1.5 Test Results

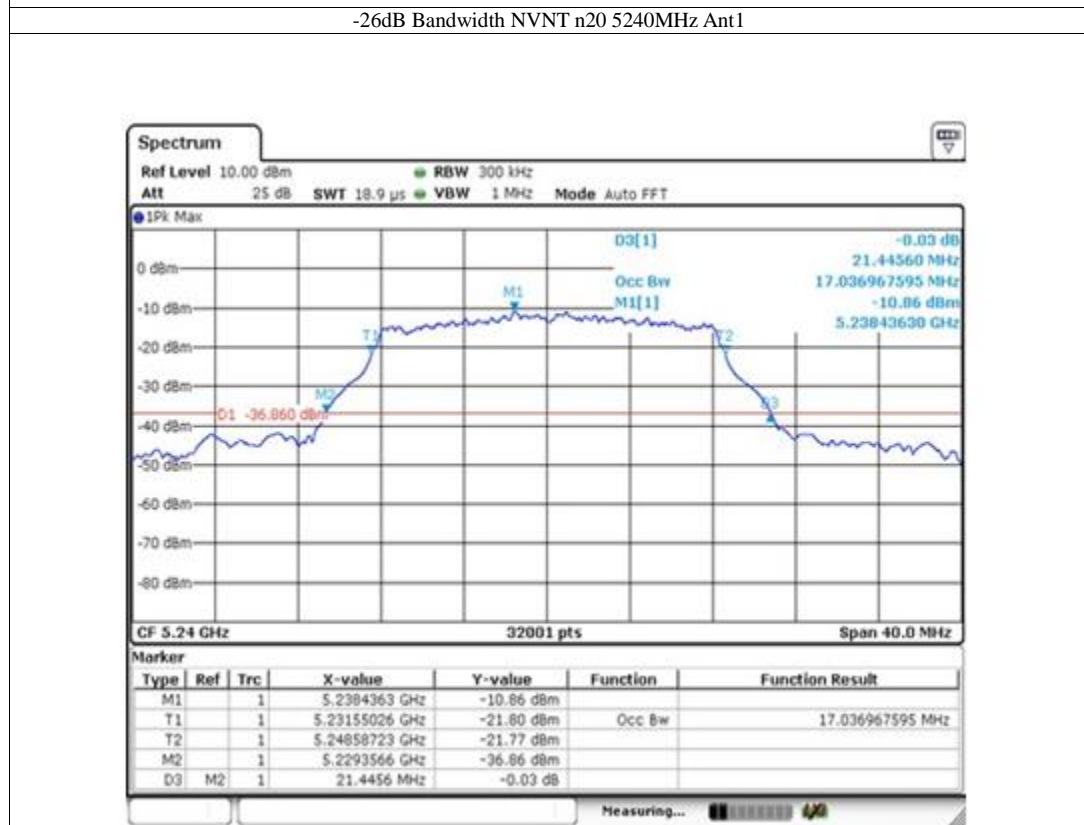
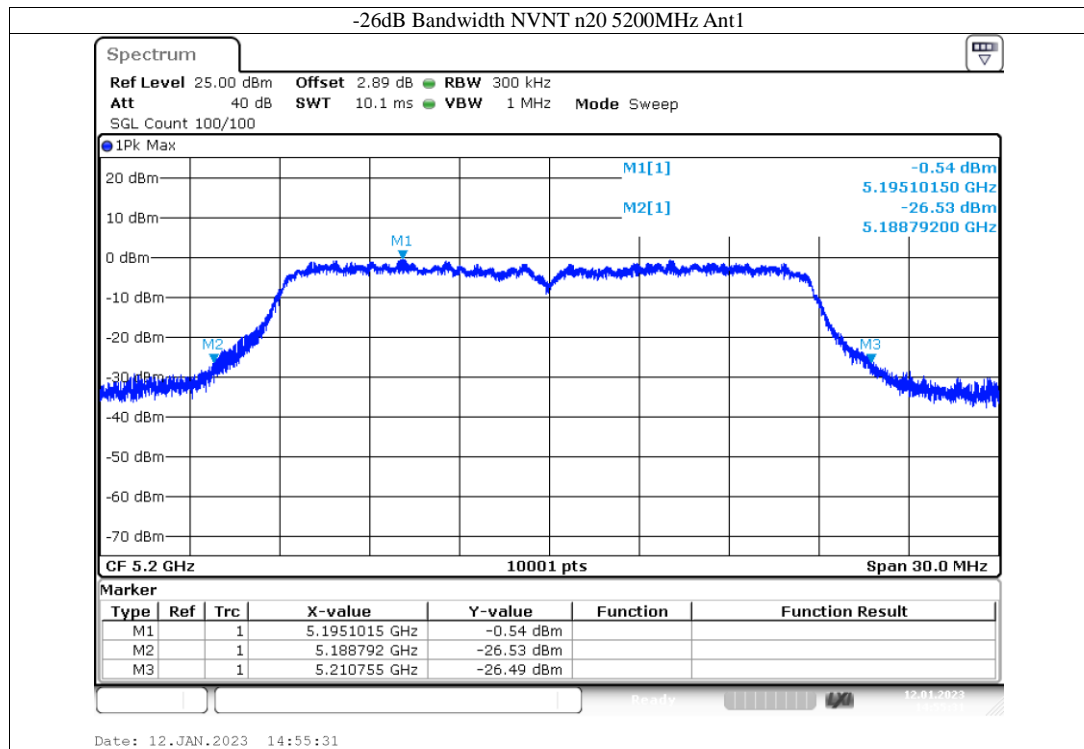
<input checked="" type="checkbox"/> 802.11a mode						
Temperature : 28°C		Test Date : February 15, 2023				
Humidity : 65 %		Test By: Jack				
Band	Channel Number	Channel Freq. (MHz)	26dB EBW	99% OBW	Limit (MHz)	Verdict
UNII Band I	CH36	5180	23.463	16.585	N/A	N/A
	CH40	5200	23.43	16.576	N/A	N/A
	CH48	5240	21.446	16.591	N/A	N/A
UNII Band III	CH149	5745	N/A	16.564	N/A	N/A
	CH157	5785	N/A	16.57	N/A	N/A
	CH165	5825	N/A	16.537	N/A	N/A
Note: N/A (Not Applicable)						

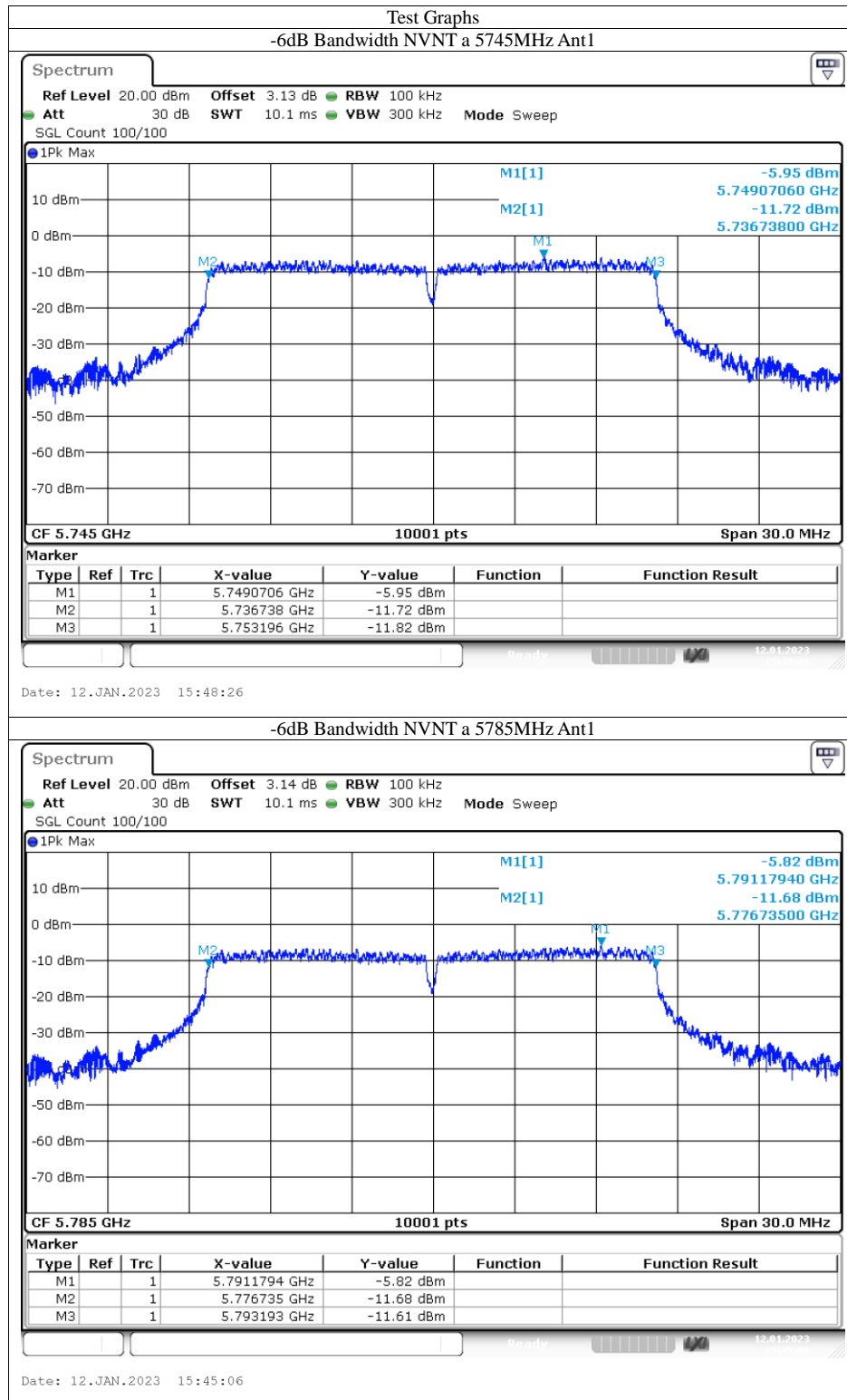
<input checked="" type="checkbox"/> 802.11n(HT20) mode						
Temperature : 28°C		Test Date : 2023-01-15				
Humidity : 65 %		Test By: Sunshine				
Band	Channel Number	Channel Freq. (MHz)	26dB EBW	99% OBW	Limit (MHz)	Verdict
UNII Band I	CH36	5180	21.87	17.701	N/A	N/A
	CH40	5200	21.963	17.731	N/A	N/A
	CH48	5240	22.263	17.707	N/A	N/A
UNII Band III	CH149	5745	N/A	17.734	N/A	N/A
	CH157	5785	N/A	17.755	N/A	N/A
	CH165	5825	N/A	17.683	N/A	N/A
Note: N/A (Not Applicable)						

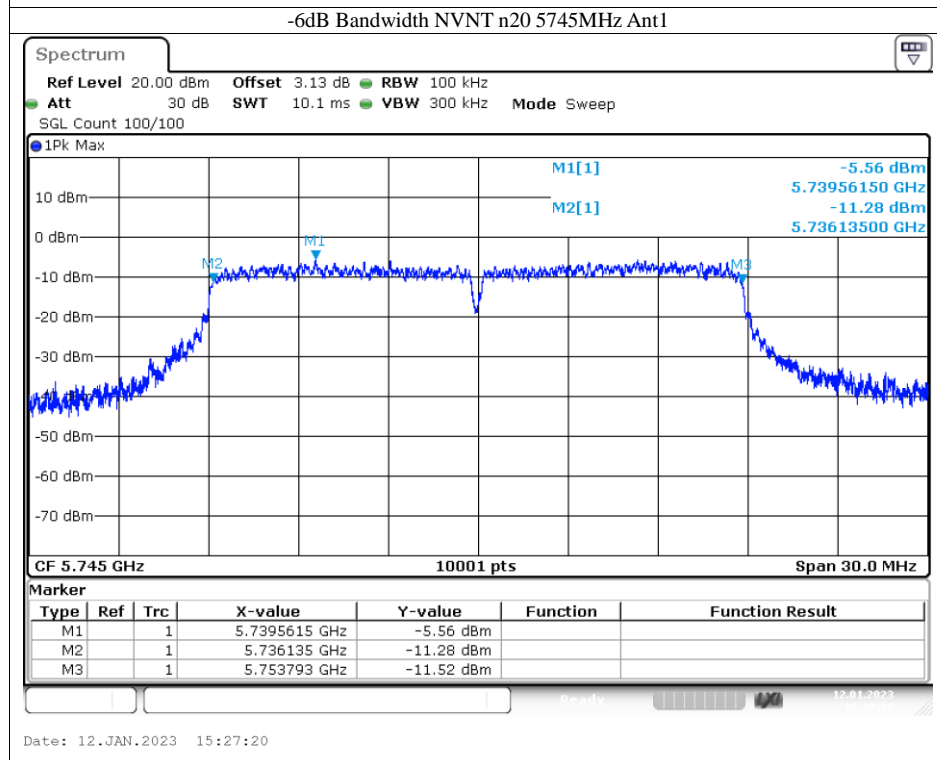
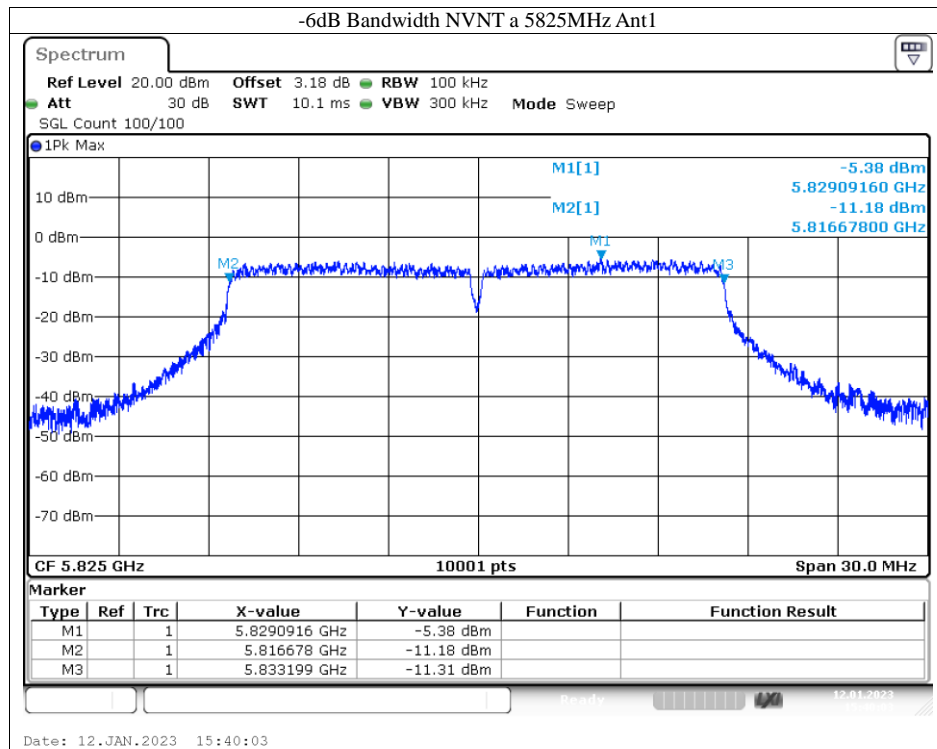
<input checked="" type="checkbox"/> UNII Band III						
Temperature : 28°C		Test Date : 2023-01-15				
Humidity : 65 %		Test By: Sunshine				
Operation Mode	Channel Number	Channel Freq. (MHz)	6dB EBW	Limit (MHz)	Verdict	
802.11a	CH149	5745	16.458	500	PASS	
	CH157	5785	16.458	500	PASS	
	CH165	5825	16.521	500	PASS	
802.11n (HT20)	CH149	5745	17.658	500	PASS	
	CH157	5785	17.718	500	PASS	
	CH165	5825	17.667	500	PASS	
Note: N/A (Not Applicable)						

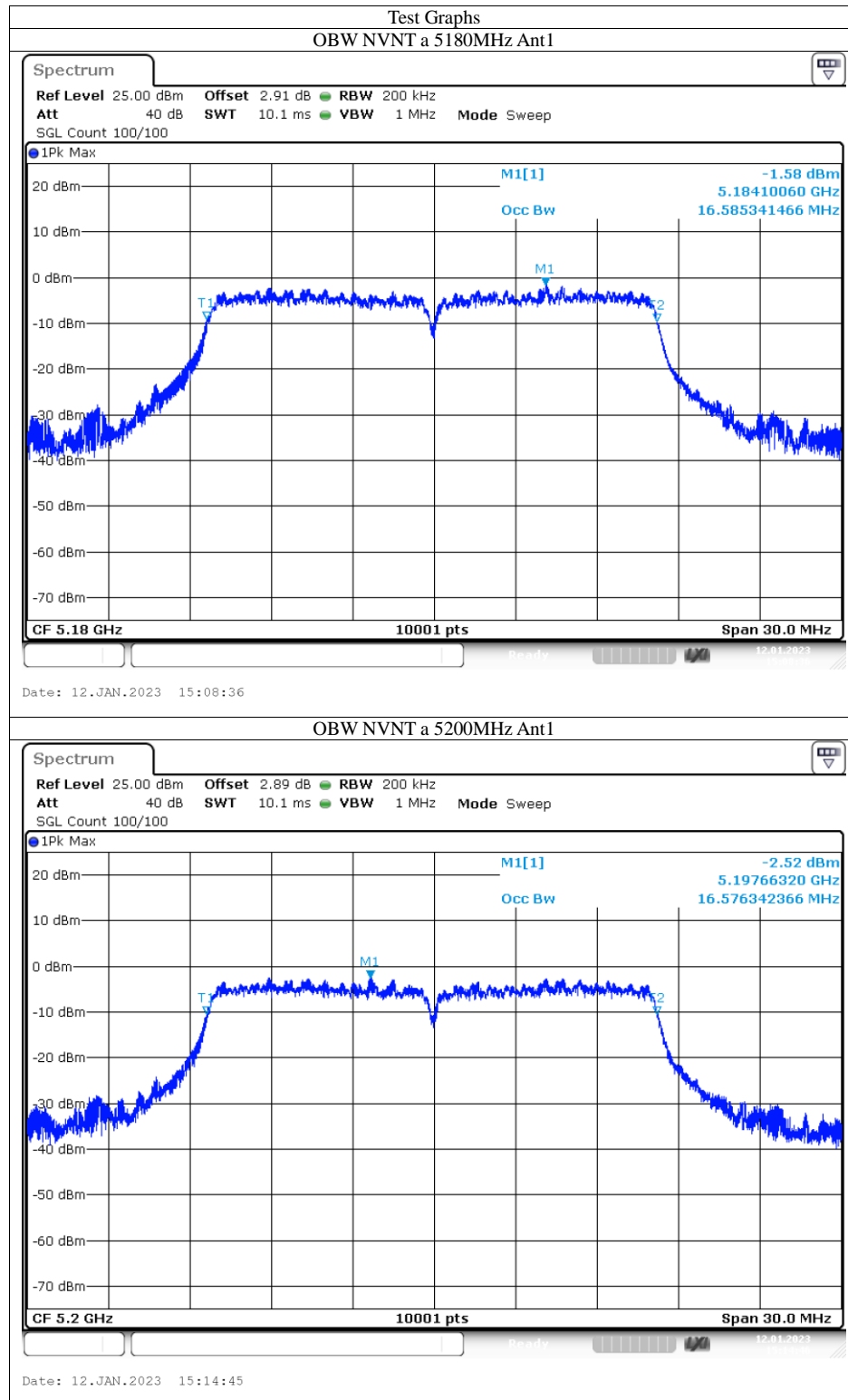


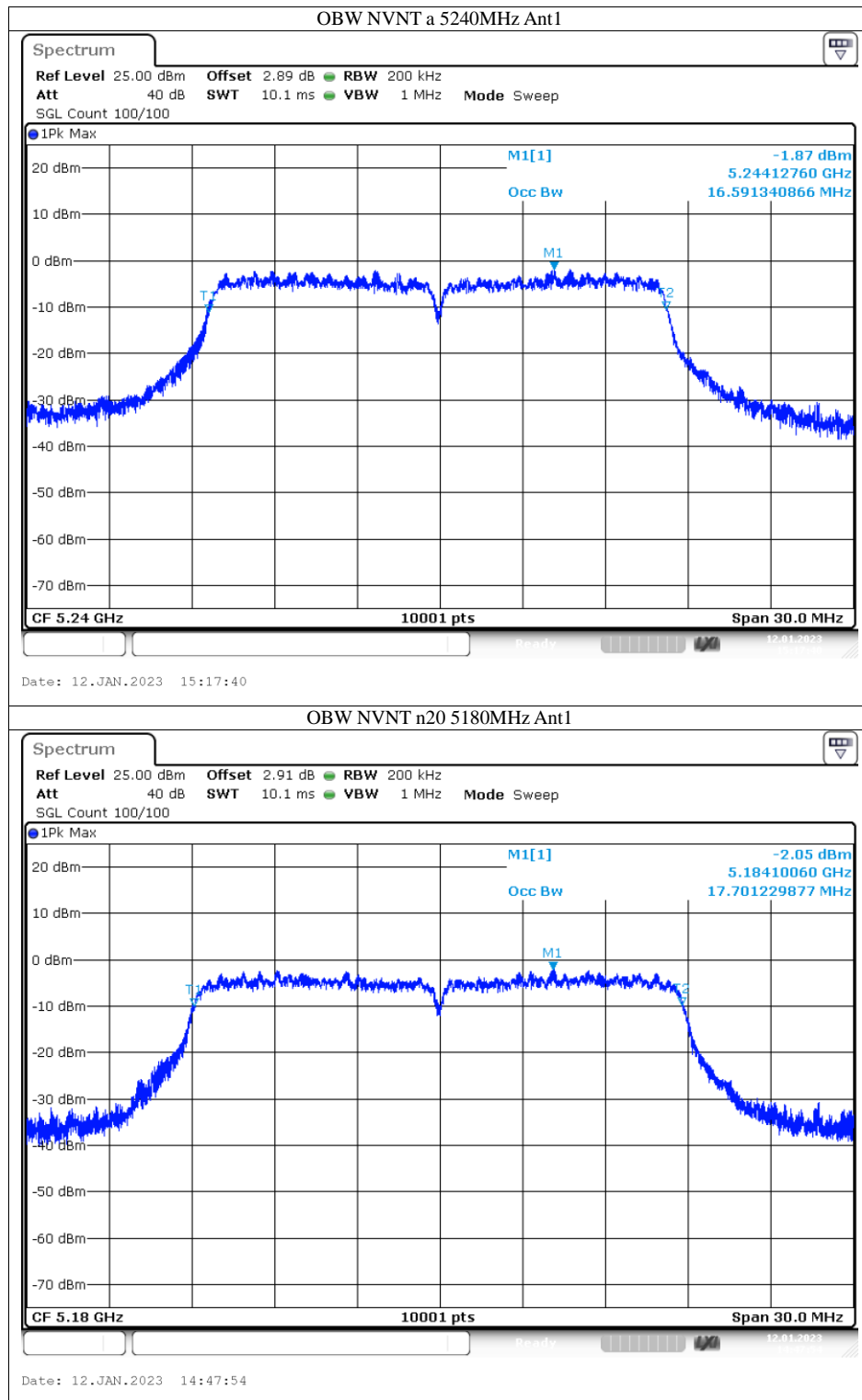


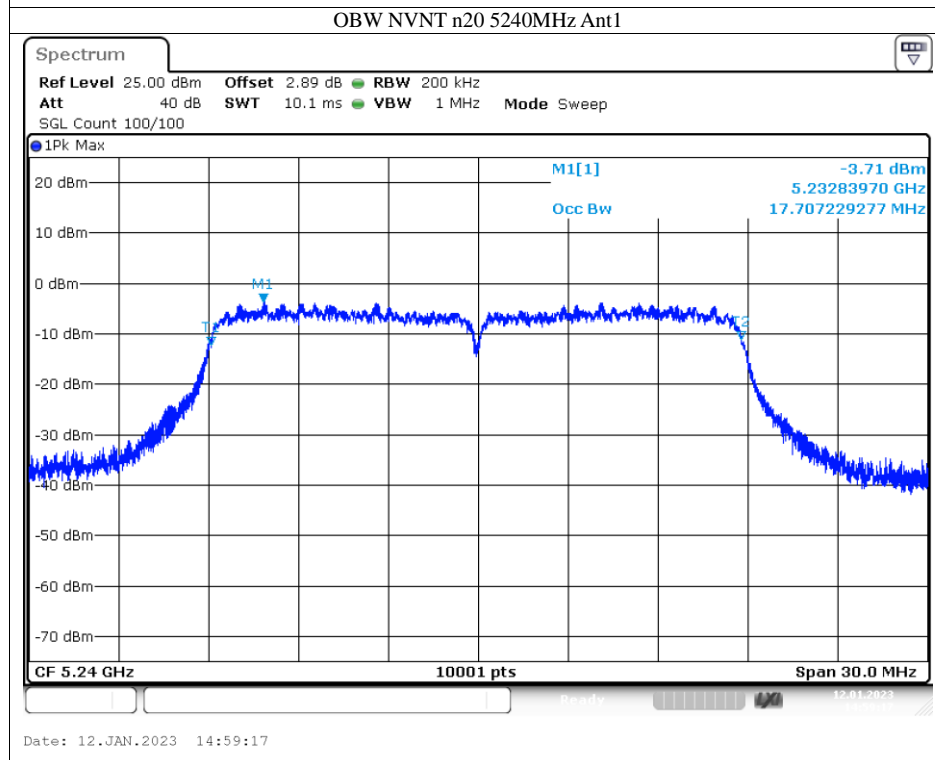
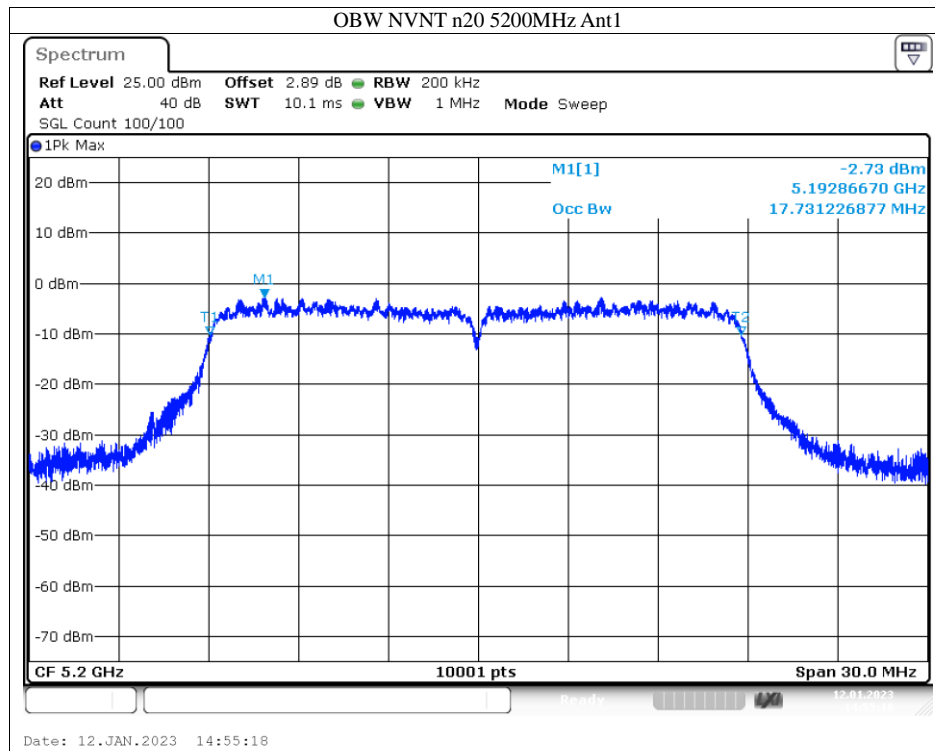


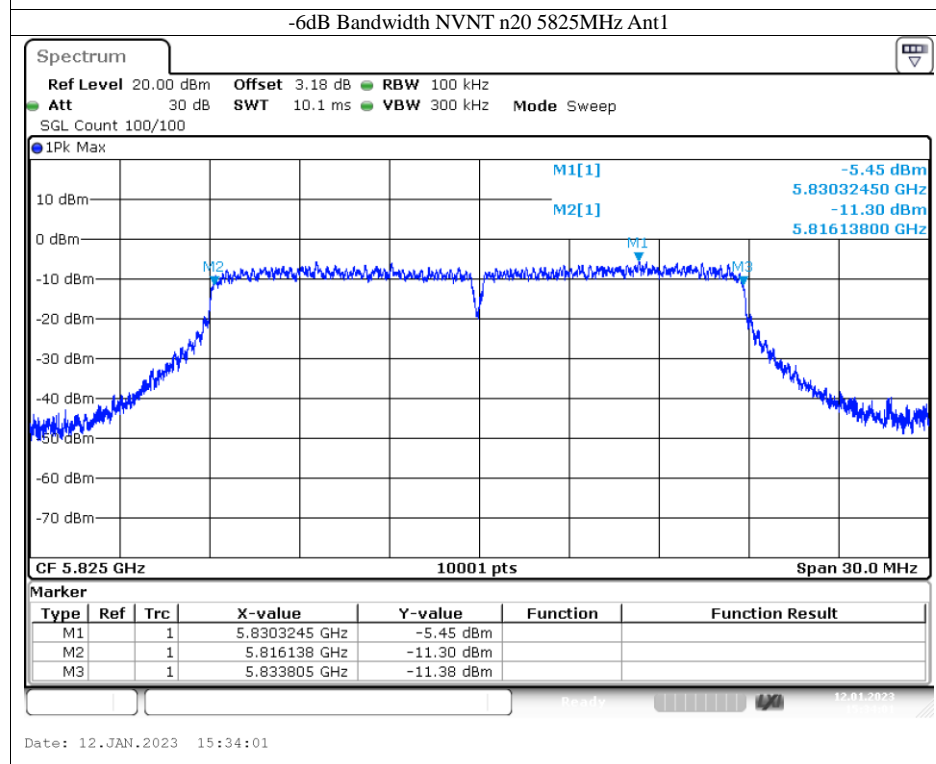
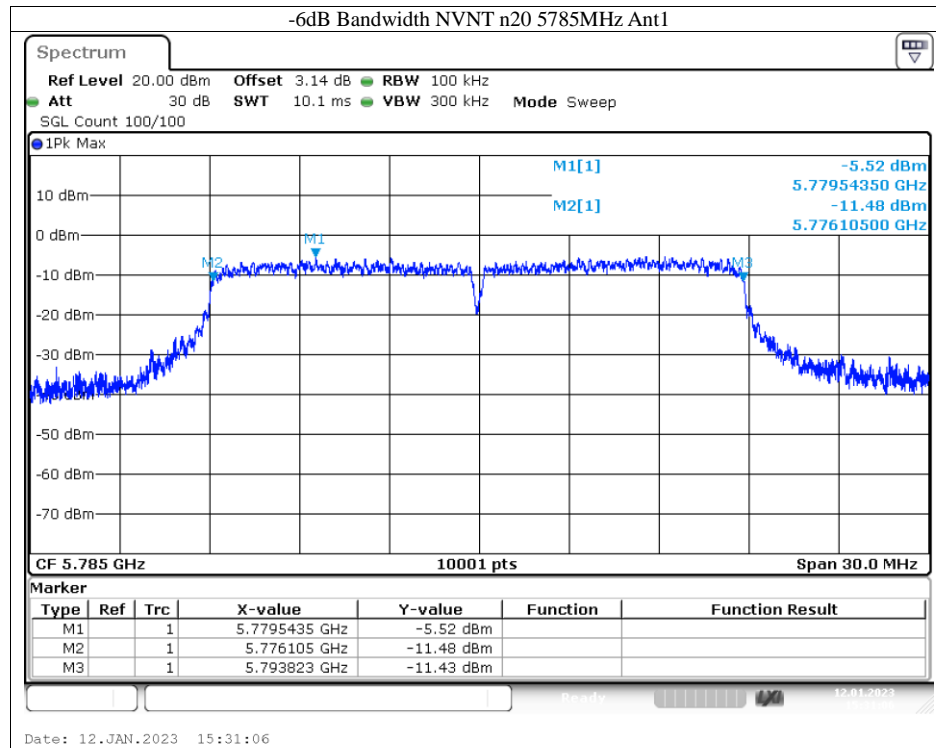


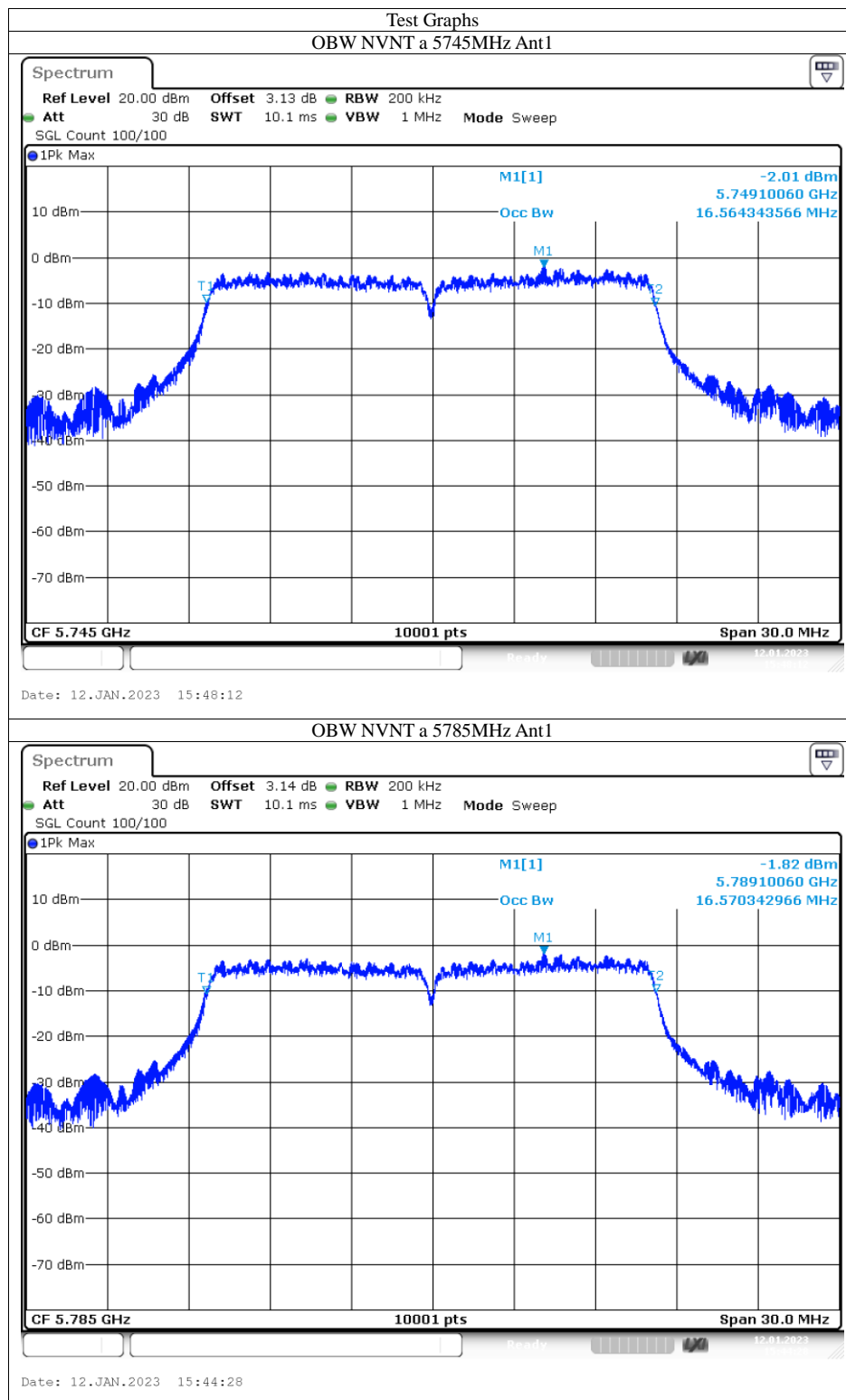


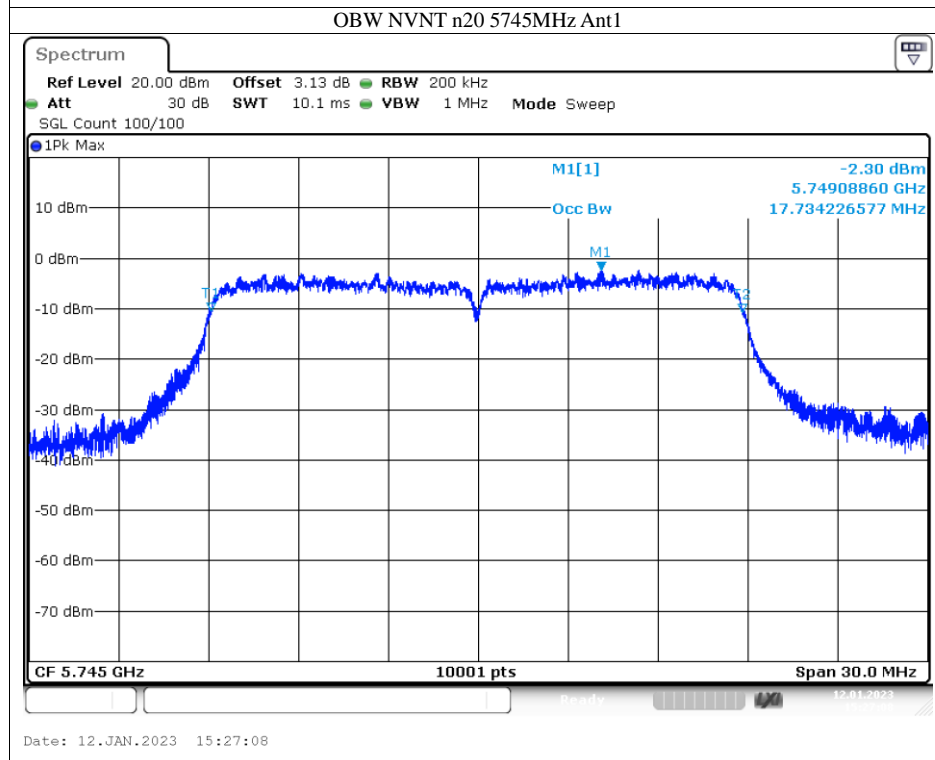
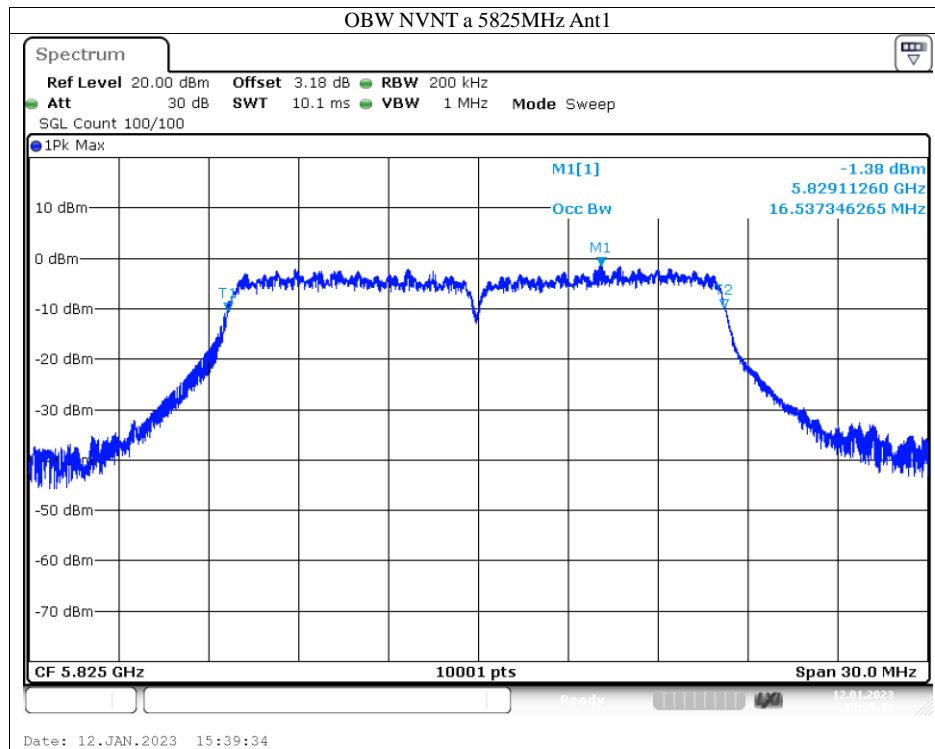


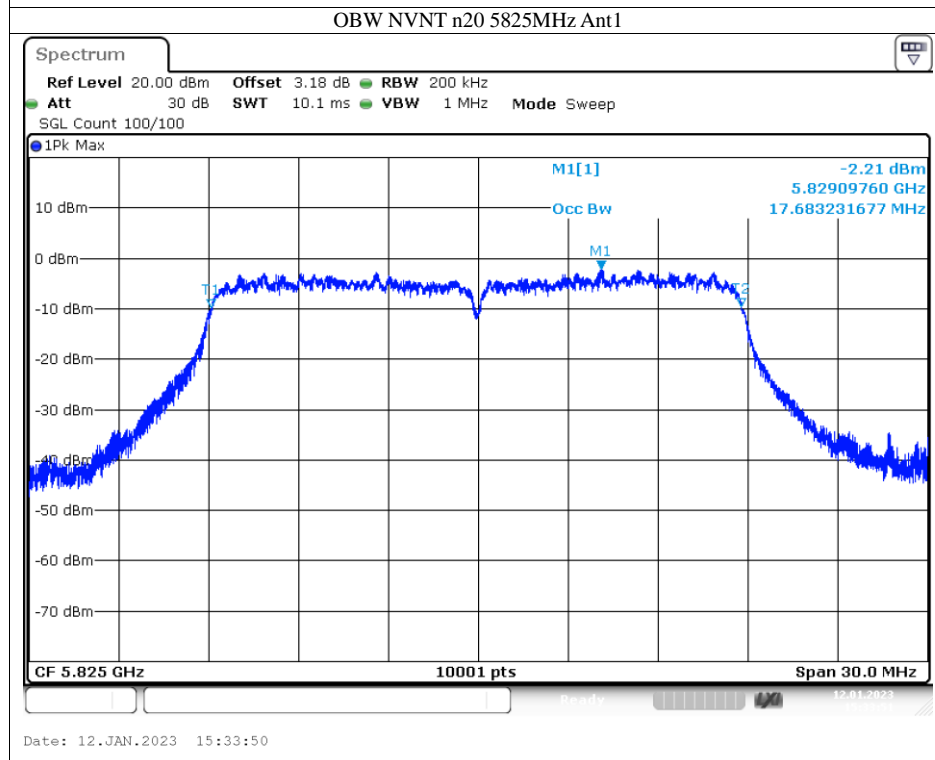
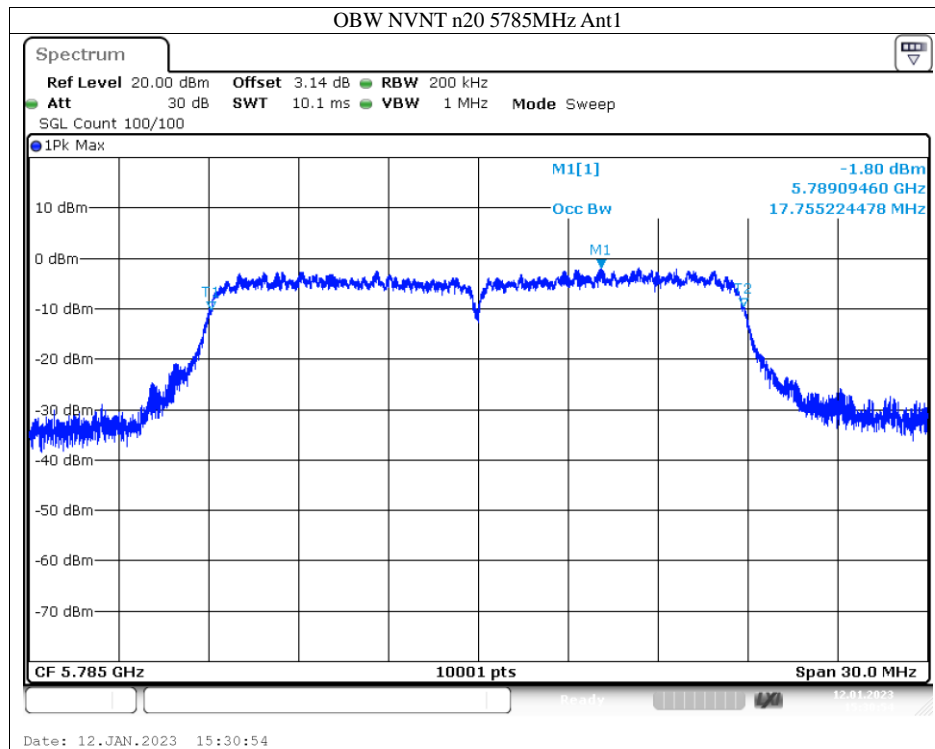












8.2 MAXIMUM CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I

According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C

According to FCC Part 15.407(a)(3) for UNII Band III

According to 789033 D02 Section II(E)

8.2.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (i) For an outdoor 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. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. 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.

(a) (1) (iii) For fixed point-to-point access points 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. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(a) (1) (iv) For mobile and portable 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. 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

(2) 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

(a) (3) 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.

8.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.2.4 Test Procedure

The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

- a. The Transmitter output (antenna port) was connected to the power meter.
- b. Turn on the EUT and power meter and then record the power value.
- c. Repeat above procedures on all channels needed to be tested.

8.2.5 Test Results

<input checked="" type="checkbox"/> 802.11a mode					
Temperature : 28°C		Test Date : 2023-01-15			
Humidity : 65 %		Test By: Sunshine			
Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
UNII Band I	CH36	5180	6.14	24	Pass
	CH40	5200	6.23	24	Pass
	CH48	5240	6.15	24	Pass
UNII Band III	CH149	5745	5.92	30	Pass
	CH157	5785	5.87	30	Pass
	CH165	5825	5.74	30	Pass
Note: N/A (Not Applicable)					

<input checked="" type="checkbox"/> 802.11n(HT20) mode					
Temperature : 28°C		Test Date : 2023-01-15			
Humidity : 65 %		Test By: Sunshine			
Band	Channel Number	Channel Freq. (MHz)	Conducted Output Power(dBm)	Limit (dBm)	Verdict
UNII Band I	CH36	5180	6.20	24	Pass
	CH40	5200	6.14	24	Pass
	CH48	5240	6.17	24	Pass
UNII Band III	CH149	5745	5.82	30	Pass
	CH157	5785	5.87	30	Pass
	CH165	5825	5.58	30	Pass
Note: N/A (Not Applicable)					

8.3 MAXIMUM PEAK POWER DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I

According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C

According to FCC Part 15.407(a)(3) for UNII Band III

According to 789033 D02 Section II(F)

8.3.2 Conformance Limit

■ For the band 5.15-5.25 GHz,

(a) (1) (i) For an outdoor 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. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. 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.

(a) (1) (iii) For fixed point-to-point access points 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. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(a) (1) (iv) For mobile and portable 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. 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

(a) (2) 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

(a) (3) 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.

8.3.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.3.4 Test Procedure

Methods refer to FCC KDB 789033

1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test TRF NO. FCC15.407/A

method (SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...".

2) Use the peak search function on the instrument to find the peak of the spectrum.

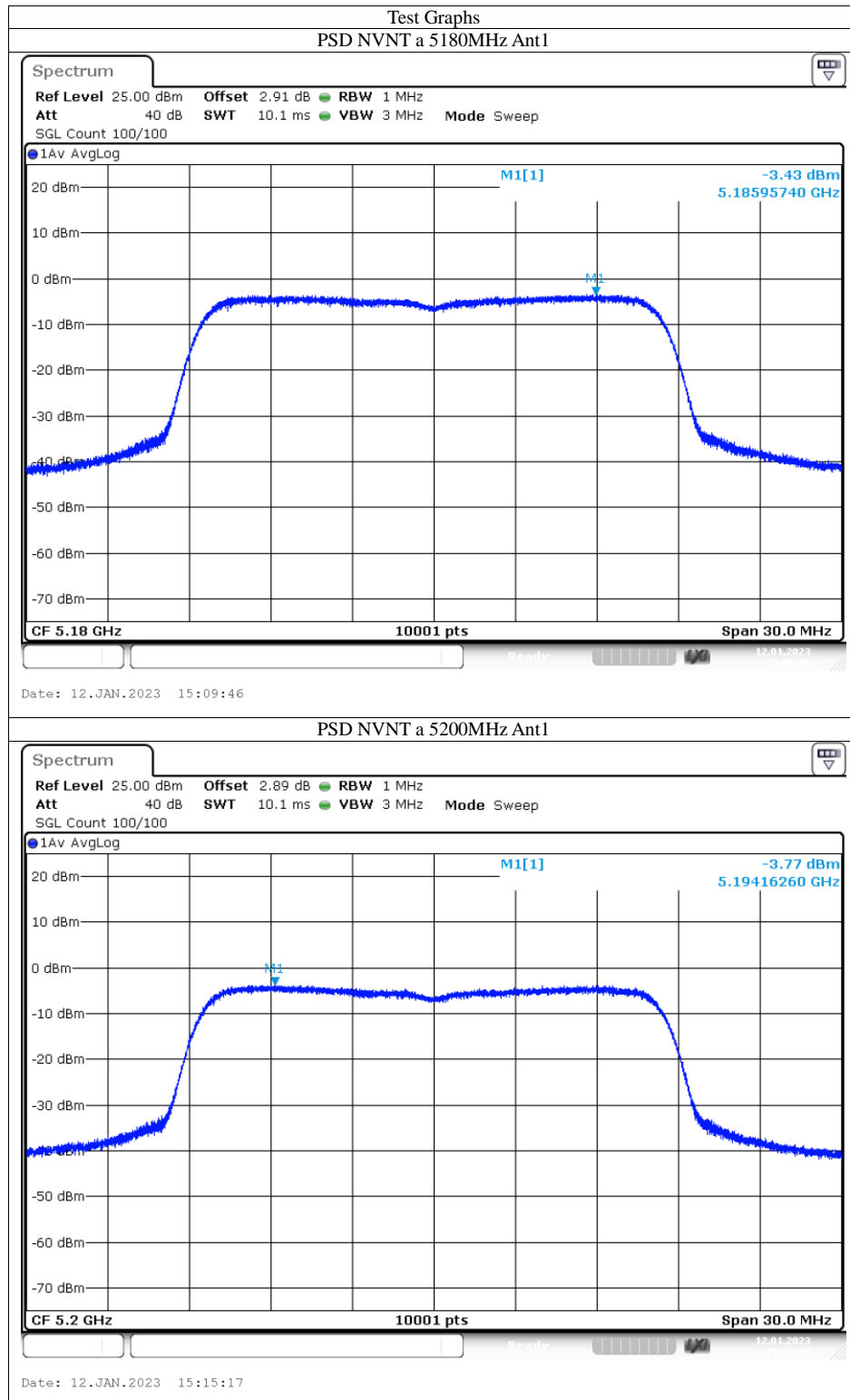
3) The result is the PPSD.

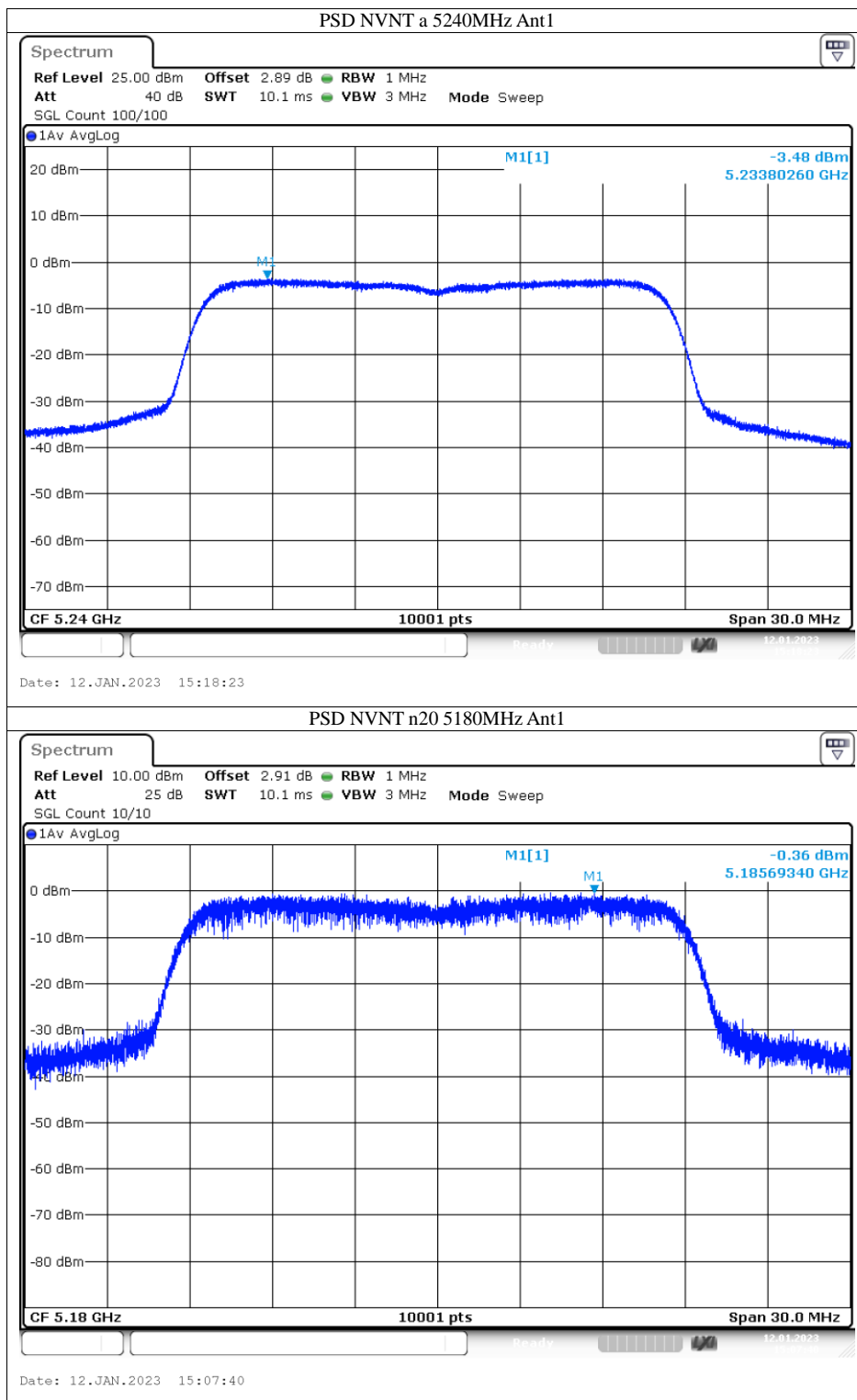
4) The above procedures make use of 500kHz resolution bandwidth to satisfy the 500kHz measurement bandwidth specified in the 15.407(a)(5). That rule section also permits use of resolution bandwidths less than 1 MHz "provided that the measured power is integrated to show the total power over the measurement bandwidth" (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 500kHz bandwidth.

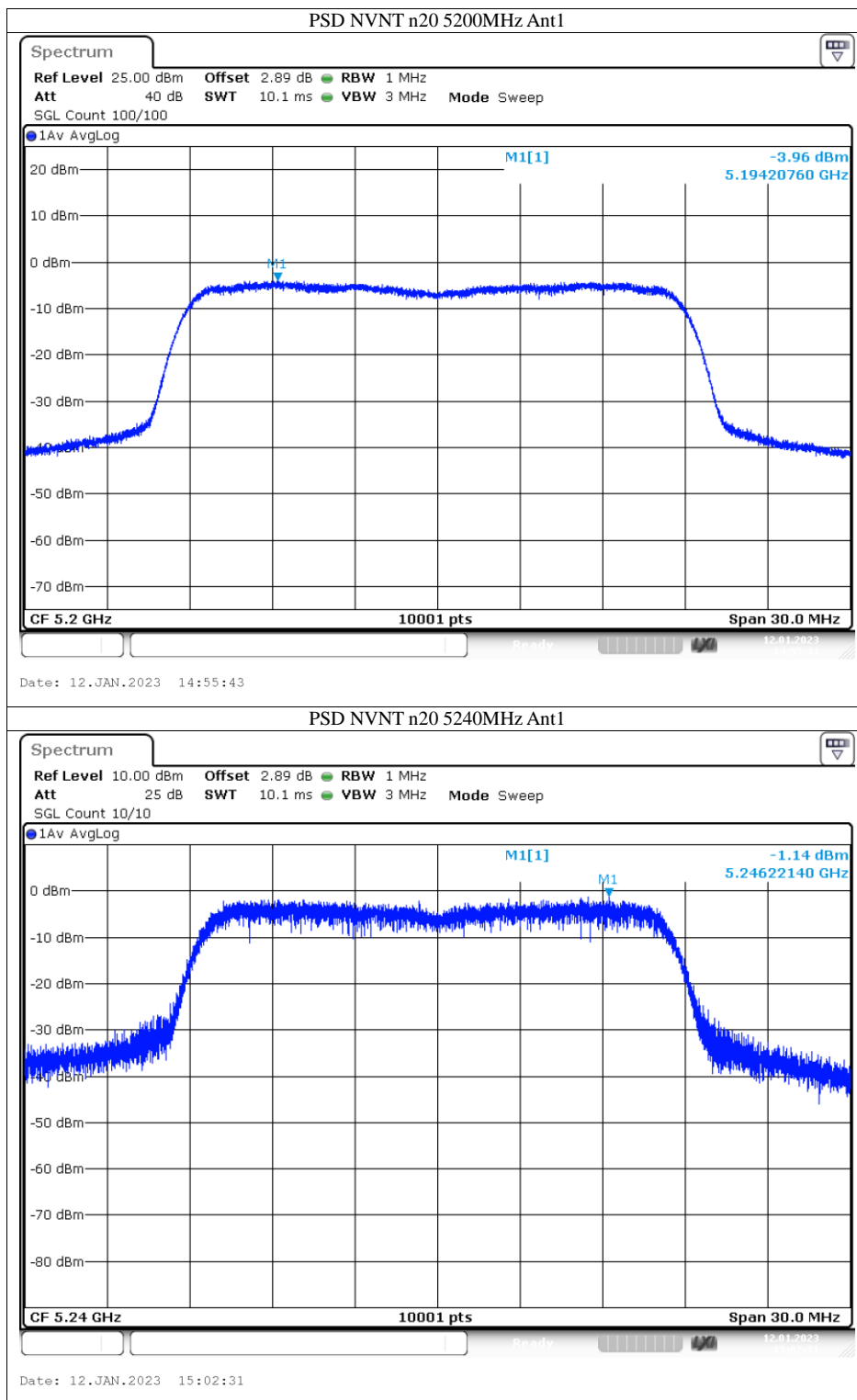
8.3.5 Test Results

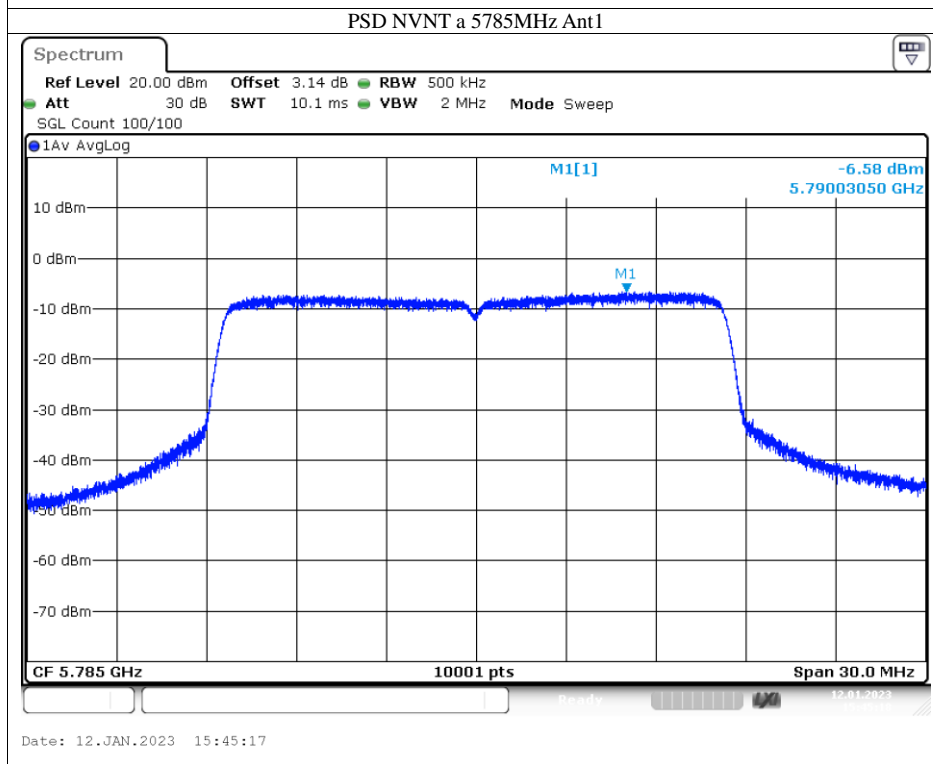
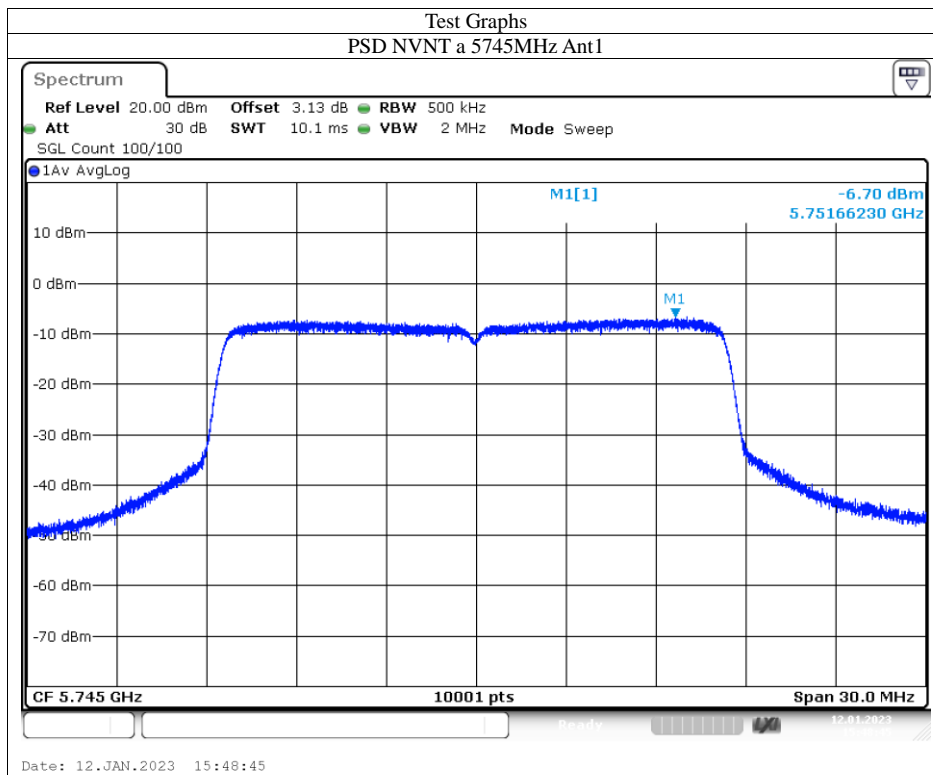
<div> <input checked="" type="checkbox"/> 802.11a mode </div>					
Temperature :		28°C	Test Date :		2023-01-15.
Humidity :		65 %	Test By:		Sunshine
Band	Channel Number	Channel Freq. (MHz)	Power Spectral Density	Limit	Verdict
UNII Band I	CH36	5180	-3.43	≤11dBm/1MHz	Pass
	CH40	5200	-3.77	≤11dBm/1MHz	Pass
	CH48	5240	-3.48	≤11dBm/1MHz	Pass
UNII Band III	CH149	5745	-6.7	≤30dBm/500KHz	Pass
	CH157	5785	-6.58	≤30dBm/500KHz	Pass
	CH165	5825	-6.13	≤30dBm/500KHz	Pass
Note: N/A (Not Applicable)					

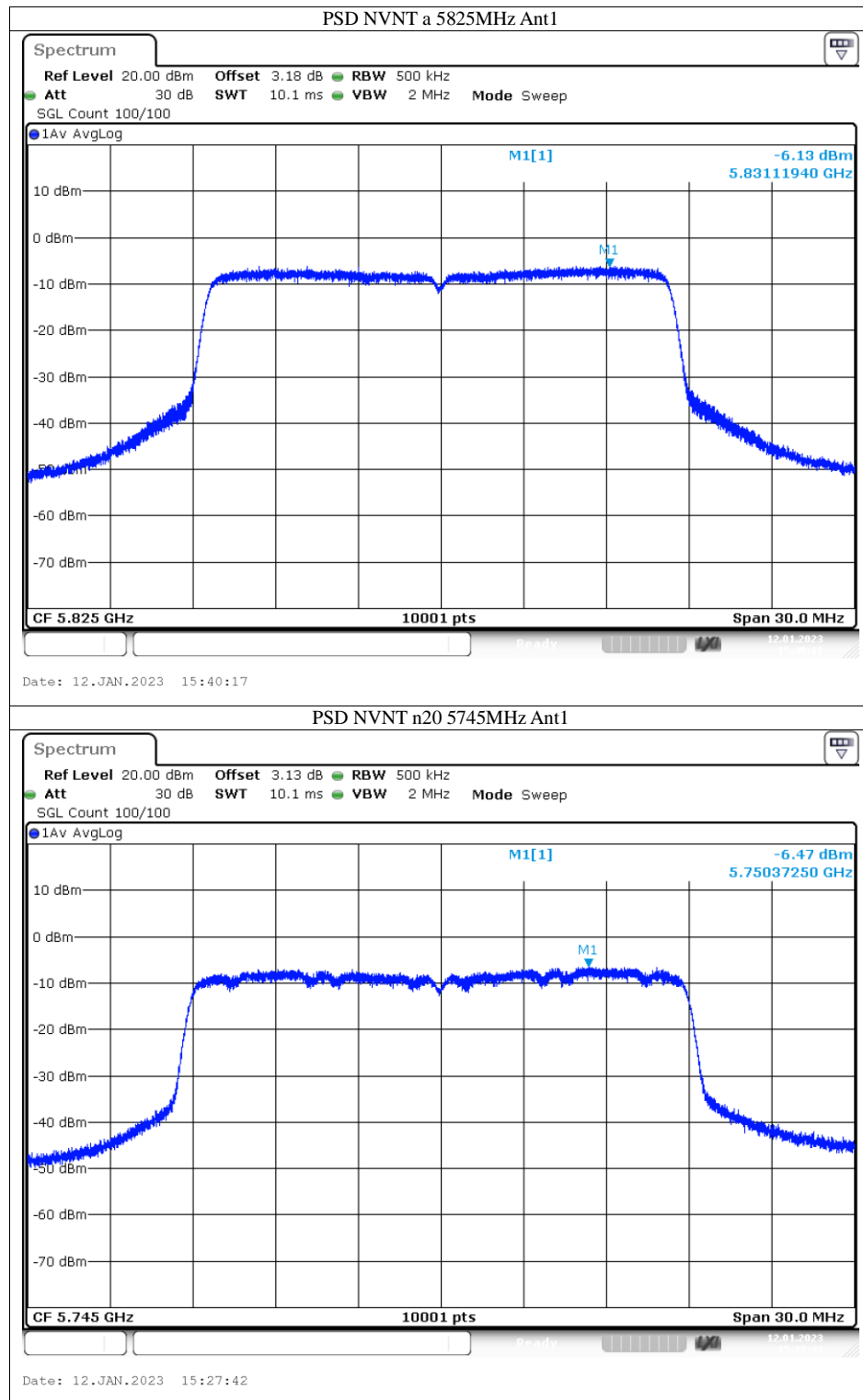
<div> <input checked="" type="checkbox"/> 802.11n(HT20) mode </div>					
Temperature :		28°C	Test Date :		2023-01-15.
Humidity :		65 %	Test By:		Sunshine
Band	Channel Number	Channel Freq. (MHz)	Power Spectral Density	Limit	Verdict
UNII Band I	CH36	5180	-0.36	≤11dBm/1MHz	Pass
	CH40	5200	-3.96	≤11dBm/1MHz	Pass
	CH48	5240	-1.14	≤11dBm/1MHz	Pass
UNII Band III	CH149	5745	-6.47	≤30dBm/500KHz	Pass
	CH157	5785	-5.69	≤30dBm/500KHz	Pass
	CH165	5825	-6.28	≤30dBm/500KHz	Pass
Note: N/A (Not Applicable)					

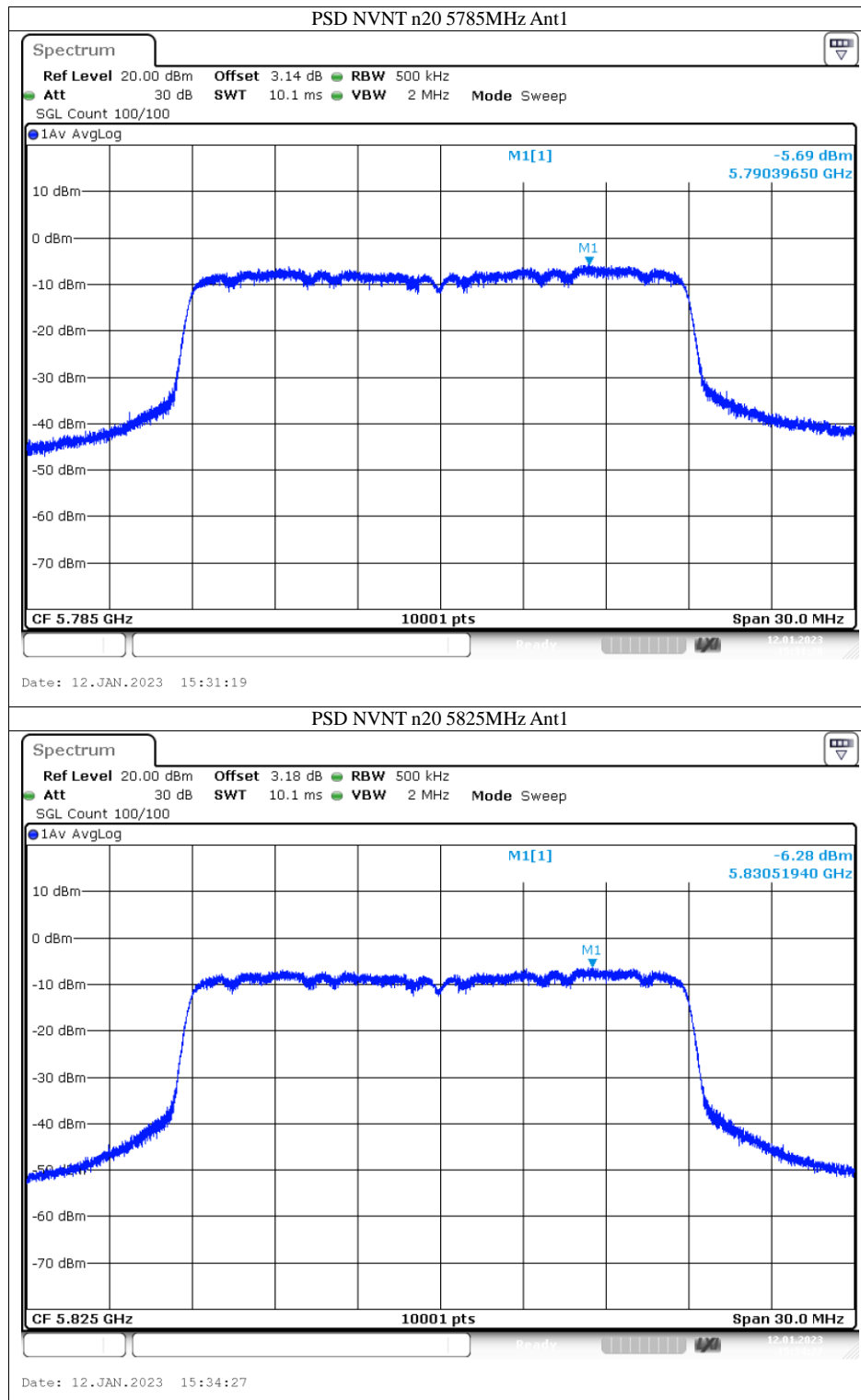












8.4 FREQUENCY STABILITY

8.4.1 Applicable Standard

According to FCC Part 15.407(g)
ANSI C63.10 Section 6.8

8.4.2 Conformance Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

8.4.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

8.4.4 Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 10 kHz.

Set the video bandwidth (VBW) =30 kHz.

Set Span= Entire absence of modulation emissions bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value.

Beginning at each temperature level specified in user manual , the frequency shall be measured within one minute after application of primary power to the transmitter and at intervals of no more than one minute thereafter until ten minutes have elapsed or until sufficient measurements are obtained to indicate clearly that the frequency has stabilized within the applicable tolerance, whichever time period is greater. During each test, the ambient temperature shall not be allowed to rise more than 10° centigrade above the respective beginning ambient temperature level

Measure and record the results in the test report.

8.4.5 Test Results

802.11a mode		5180		
Temperature :	--	Test Date :	2023-01-15	
Humidity :	65 %	Test By:	Sunshine	
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5179.969748	-30.252	Pass
	-10	5179.969369	-30.631	Pass
	0	5179.969624	-30.376	Pass
	10	5179.969458	-30.542	Pass
	20	5179.969642	-30.358	Pass
	30	5179.969257	-30.743	Pass
	40	5179.970781	-29.219	Pass
	50	5179.969962	-30.038	Pass
85% Vnom	20	5179.969145	-30.855	Pass
115% Vnom	20	5179.969556	-30.444	Pass

802.11a mode		5200		
Temperature :	--	Test Date :	2023-01-15	
Humidity :	65 %	Test By:	Sunshine	
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5199.961478	-38.522	Pass
	-10	5199.961258	-38.742	Pass
	0	5199.961649	-38.351	Pass
	10	5199.961512	-38.488	Pass
	20	5200.031264	31.264	Pass
	30	5199.961671	-38.329	Pass
	40	5199.961151	-38.849	Pass
	50	5199.961256	-38.744	Pass
85% Vnom	20	5199.961369	-38.631	Pass
115% Vnom	20	5199.961157	-38.843	Pass

802.11a mode		5240		
Temperature :	--	Test Date :	2023-01-15	
Humidity :	65 %	Test By:	Sunshine	
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5239.977784	-22.216	Pass
	-10	5239.977156	-22.844	Pass
	0	5239.977261	-22.739	Pass
	10	5239.977348	-22.652	Pass
	20	5239.977691	-22.309	Pass
	30	5239.977247	-22.753	Pass
	40	5239.977582	-22.418	Pass
	50	5239.978146	-21.854	Pass
85% Vnom	20	5239.977134	-22.866	Pass
115% Vnom	20	5239.977592	-22.408	Pass

802.11a mode		5745		
Temperature :	--	Test Date :	August 16, 2018.	
Humidity :	65 %	Test By:	Sunshine	
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5744.986861	-13.139	Pass
	-10	5744.986542	-13.458	Pass
	0	5744.986364	-13.636	Pass
	10	5744.986394	-13.606	Pass
	20	5744.986548	-13.452	Pass
	30	5744.986852	-13.148	Pass
	40	5744.986264	-13.736	Pass
	50	5744.986471	-13.529	Pass
85% Vnom	20	5744.986259	-13.741	Pass
115% Vnom	20	5744.986364	-13.636	Pass

802.11a mode		5785		
Temperature :	--	Test Date :	2023-01-15	
Humidity :	65 %	Test By:	Sunshine	
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5784.991774	-8.226	Pass
	-10	5784.991451	-8.549	Pass
	0	5784.991523	-8.477	Pass
	10	5784.991036	-8.964	Pass
	20	5784.991694	-8.306	Pass
	30	5784.991874	-8.126	Pass
	40	5784.991526	-8.474	Pass
	50	5784.991448	-8.552	Pass
85% Vnom	20	5784.991521	-8.479	Pass
115% Vnom	20	5784.991369	-8.631	Pass

802.11a mode		5825		
Temperature :	--	Test Date :	2023-01-15	
Humidity :	65 %	Test By:	Sunshine	
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5824.982756	-17.244	Pass
	-10	5824.982364	-17.636	Pass
	0	5824.982259	-17.741	Pass
	10	5824.982328	-17.672	Pass
	20	5824.982841	-17.159	Pass
	30	5824.982574	-17.426	Pass
	40	5824.982264	-17.736	Pass
	50	5824.982119	-17.881	Pass
85% Vnom	20	5824.983368	-16.632	Pass
115% Vnom	20	5824.983784	-16.216	Pass

802.11n(HT20) mode		5180		
Temperature : --		Test Date :		2023-01-15
Humidity : 65 %		Test By:		Sunshine
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5180.001854	1.854	Pass
	-10	5180.001541	1.541	Pass
	0	5180.001256	1.256	Pass
	10	5180.001364	1.364	Pass
	20	5180.001259	1.259	Pass
	30	5180.001548	1.548	Pass
	40	5180.001241	1.241	Pass
	50	5180.001256	1.256	Pass
85% Vnom	20	5180.001214	1.214	Pass
115% Vnom	20	5180.002580	2.580	Pass

802.11n(HT20) mode		5200		
Temperature : --		Test Date :		2023-01-15
Humidity : 65 %		Test By:		Sunshine
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5199.976754	-23.246	Pass
	-10	5199.975584	-24.416	Pass
	0	5199.975369	-24.631	Pass
	10	5199.975112	-24.888	Pass
	20	5199.975358	-24.642	Pass
	30	5199.975445	-24.555	Pass
	40	5199.975564	-24.436	Pass
	50	5199.975234	-24.766	Pass
85% Vnom	20	5199.975249	-24.751	Pass
115% Vnom	20	5199.976561	-23.439	Pass

802.11n(HT20) mode		5240		
Temperature : --		Test Date :		2023-01-15
Humidity : 65 %		Test By:		Sunshine
Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5239.982485	-17.515	Pass
	-10	5239.981364	-18.636	Pass
	0	5239.981225	-18.775	Pass
	10	5239.981113	-18.887	Pass
	20	5239.981364	-18.636	Pass
	30	5239.981485	-18.515	Pass
	40	5239.981159	-18.841	Pass
	50	5239.981657	-18.343	Pass
85% Vnom	20	5239.981112	-18.888	Pass
115% Vnom	20	5239.981369	-18.631	Pass

802.11n(HT20)	mode	5745
Temperature :	--	Test Date : 2023-01-15
Humidity :	65 %	Test By: Sunshine

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5744.980485	-19.515	Pass
	-10	5744.980334	-19.666	Pass
	0	5744.980248	-19.752	Pass
	10	5744.980695	-19.305	Pass
	20	5744.980357	-19.643	Pass
	30	5744.980886	-19.114	Pass
	40	5744.980141	-19.859	Pass
	50	5744.980106	-19.894	Pass
85% Vnom	20	5744.980235	-19.765	Pass
115% Vnom	20	5744.983561	-16.439	Pass

802.11n(HT20)	mode	5785
Temperature :	--	Test Date : 2023-01-15
Humidity :	65 %	Test By: Sunshine

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5784.988748	-11.252	Pass
	-10	5784.988546	-11.454	Pass
	0	5784.988359	-11.641	Pass
	10	5784.988432	-11.568	Pass
	20	5784.988364	-11.636	Pass
	30	5784.988159	-11.841	Pass
	40	5784.988257	-11.743	Pass
	50	5784.988486	-11.514	Pass
85% Vnom	20	5784.988642	-11.358	Pass
115% Vnom	20	5784.988527	-11.473	Pass

802.11n(HT20)	mode	5825
Temperature :	--	Test Date : 2023-01-15
Humidity :	65 %	Test By: Sunshine

Voltage(V)	Temp(°C)	Test Frequency (MHz)	Max. Deviation (KHz)	Verdict
Vnom	-20	5824.991694	-8.306	Pass
	-10	5824.991548	-8.452	Pass
	0	5824.991215	-8.785	Pass
	10	5824.991164	-8.836	Pass
	20	5824.991228	-8.772	Pass
	30	5824.991154	-8.846	Pass
	40	5824.991215	-8.785	Pass
	50	5824.991254	-8.746	Pass
85% Vnom	20	5824.991166	-8.834	Pass
115% Vnom	20	5824.991659	-8.341	Pass

8.5 UNDESIRABLE RADIATED SPURIOUS EMISSION

8.5.1 Applicable Standard

According to FCC Part 15.407 (b)

According to 789033 D02 Section II(G)

8.5.2 Conformance Limit

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.

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.

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.

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

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

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	2400/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

The provisions of §15.205 apply to intentional radiators operating under this section, 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

- Remark:
1. Emission level in dBuV/m=20 log (uV/m)
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

8.5.3 Test Configuration

Test according to clause 6.2 radio frequency test setup

8.5.4 Test Procedure

■ Unwanted Emissions Measurements below 1000 MHz

Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

The EUT was placed on a turn table which is 0.8m above ground plane.

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until all frequency measured was complete.

We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes have been tested and the worst result was reported.

Use the following spectrum analyzer settings:

Set RBW=120kHz for $f < 1$ GHz(30MHz to 1GHz), 200Hz for $f < 150$ KHz(9KHz to 150KHz), 9KHz for < 30 MHz

(150KHz to 30KHz).

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Repeat above procedures until all frequency measured was complete.

■ Unwanted Maximum peak Emissions Measurements above 1000 MHz

Maximum emission levels are measured by setting the analyzer as follows:

RBW = 1 MHz.

VBW \geq 3 MHz.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately $1/x$, where x is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

■ Unwanted Average Emissions Measurements above 1000 MHz

Method VB (Averaging using reduced video bandwidth): Alternative method.

RBW = 1 MHz.

Video bandwidth. • If the EUT is configured to transmit with duty cycle \geq 98 percent, set $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.

• If the EUT duty cycle is < 98 percent, set $VBW \geq 1/T$, where T is defined in section II.B.1.a).

Video bandwidth mode or display mode • The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).

• As an alternative, the analyzer may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some analyzers require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of $1/x$, where x is the duty cycle. For example, use at least 200 traces if the duty cycle is 25 percent. (If a specific emission is demonstrated to be continuous—i.e., 100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 50 traces shall be averaged.)

■ Band edge measurements.

Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described below. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.

Marker-Delta Method.

The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

8.5.5 Test Results

■ ☒ For Undesirable radiated Spurious Emission in UNII Band I

The modes 802.11a/n(HT20) has been tested and the worst result (801.11n(HT20)) recorded as below:

● ☒ Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Temperature :	28°C	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	801.11n(HT20)	Frequency(MHz):	5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7090.32	V	54.36	-40.87	-27	-13.87
9778.73	V	60.12	-35.11	-27	-8.11
13159.31	V	59.45	-35.78	-27	-8.78
6954.23	H	54.72	-40.51	-27	-13.51
10322.76	H	61.03	-34.20	-27	-7.20
13346.24	H	60.16	-35.07	-27	-8.07

Temperature :	28°C	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	801.11n(HT20)	Frequency(MHz):	5220

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7088.95	V	55.32	-39.91	-27	-12.91
8120.73	V	53.68	-41.55	-27	-14.55
13160.36	V	60.17	-35.06	-27	-8.06
6952.89	H	54.27	-40.96	-27	-13.96
10323.82	H	60.32	-34.91	-27	-7.91
13344.89	H	59.32	-35.91	-27	-8.91

Temperature :	28°C	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	801.11n(HT20)	Frequency(MHz):	5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7087.43	V	53.42	-41.81	-27	-14.81
9780.78	V	60.38	-34.85	-27	-7.85
13158.85	V	60.25	-34.98	-27	-7.98
6951.43	H	55.42	-39.81	-27	-12.81
10324.8	H	60.32	-34.91	-27	-7.91
13343.45	H	58.24	-36.99	-27	-9.99

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77

d is the measurement distance in 3 meters

● ☒ Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

Temperature :	28°C	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	801.11n(HT20)	Frequency(MHz):	5180

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5149.05	H	65.04	-30.19	-27	Pass
5138.55	V	64.72	-30.51	-27	Pass

Temperature :	28°C	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	801.11n(HT20)	Frequency(MHz):	5240

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5352.15	V	65.12	-30.11	-27	Pass
5359.05	H	64.51	-30.72	-27	Pass

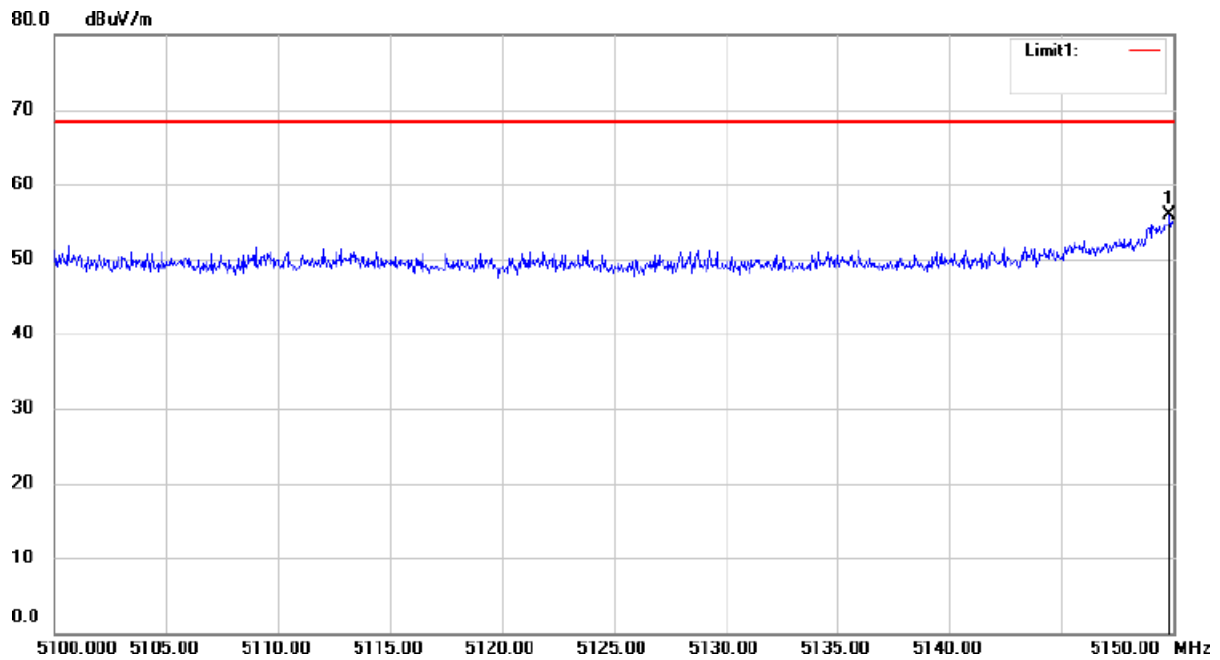
Note: (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

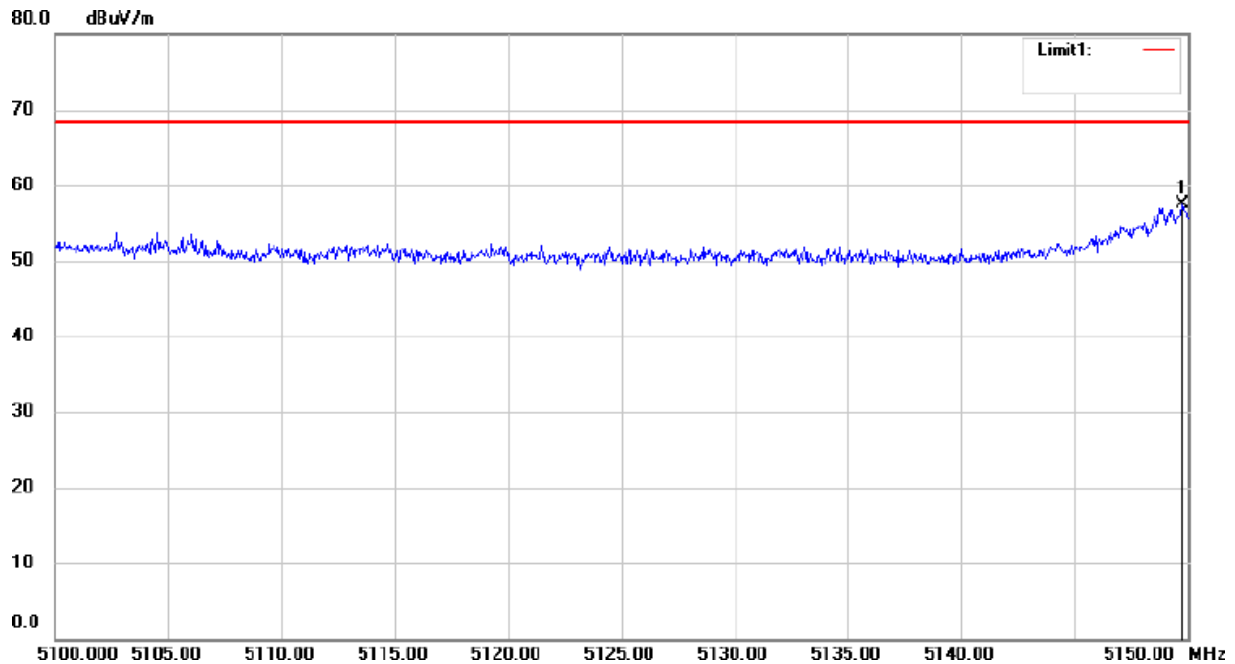
(3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77

d is the measurement distance in 3 meters

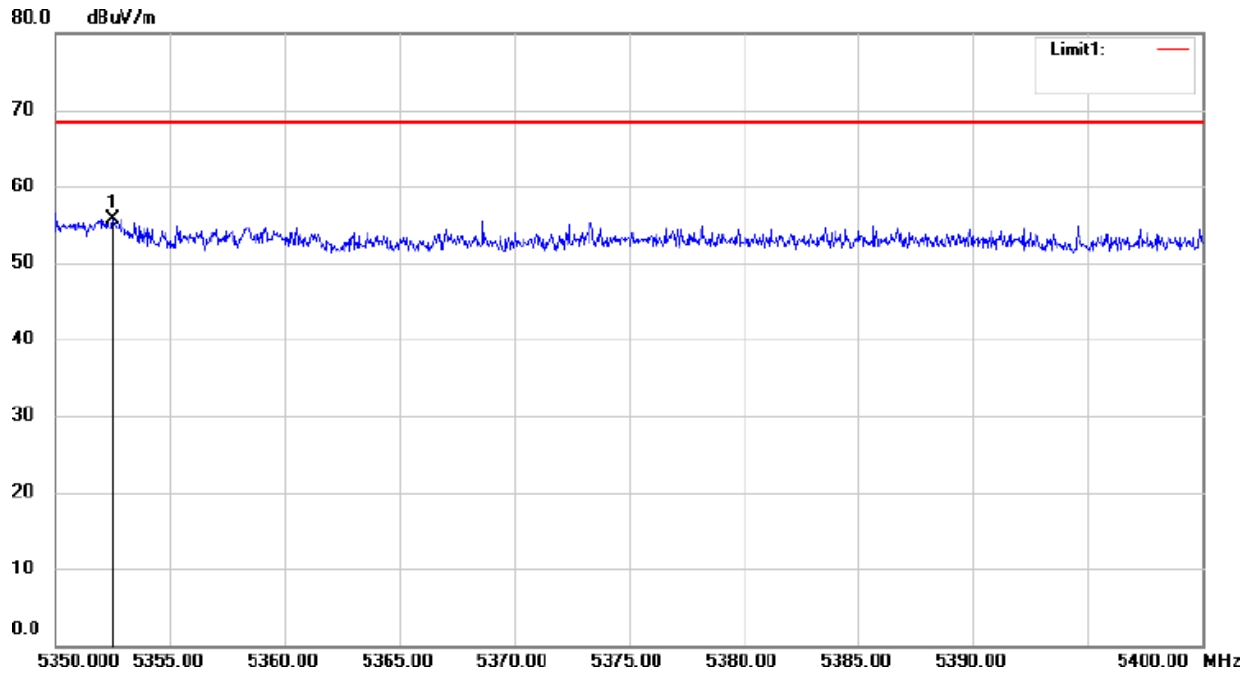
UNII Band I					
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)				
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)		
	<input checked="" type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input type="checkbox"/> 5240	Ant.Pol	H



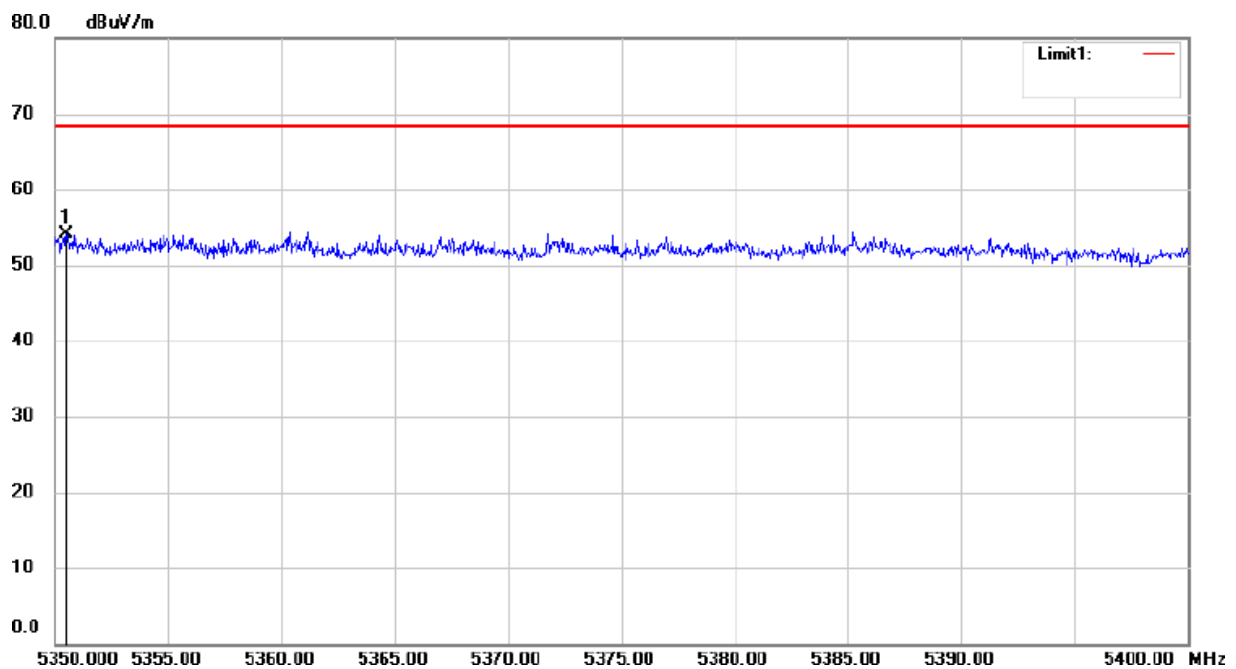
UNII Band I					
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5100-5150MHz)				
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)		
	<input checked="" type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input type="checkbox"/> 5240	Ant.Pol	V



UNII Band I					
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)				
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)		
	<input type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input checked="" type="checkbox"/> 5240	Ant.Pol	H



UNII Band I					
Test Model	Undesirable radiated Spurious Emission in Restricted Band (5350-5400MHz)				
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)		
	<input type="checkbox"/> 5180	<input type="checkbox"/> 5200	<input checked="" type="checkbox"/> 5240	Ant.Pol	V



- ☒ For Undesirable radiated Spurious Emission in UNII Band III

All the modes 802.11a/n has been tested and the worst result 802.11n(HT20) recorded as below:

- ☒ Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

Temperature :	28℃	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	802.11n(HT20)	Frequency(MHz):	5745

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7142.69	V	50.33	-44.9	-27.00	-17.9
9838.38	V	51.49	-43.74	-27.00	-16.74
13214.11	V	67.97	-27.26	-27.00	-0.26
7004.02	H	55.58	-39.65	-27.00	-12.65
10382.46	H	60.81	-34.42	-27.00	-7.42
13398.47	H	63.26	-31.97	-27.00	-4.97

Temperature :	28℃	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	802.11n(HT20)	Frequency(MHz):	5785

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7141.34	V	45.34	-49.89	-27.00	-22.89
9837	V	46.56	-48.67	-27.00	-21.67
13215.18	V	59.18	-36.05	-27.00	-9.05
7005.12	H	48.72	-46.51	-27.00	-19.51
10381.03	H	52.69	-42.54	-27.00	-15.54
13399.45	H	55.83	-39.4	-27.00	-12.4

Temperature :	28℃	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	802.11n(HT20)	Frequency(MHz):	5825

Freq. (MHz)	Ant.Pol. H/V	Field Strength (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Over(dB)
7142.41	V	45.77	-49.46	-27.00	-22.46
9835.63	V	46.49	-48.74	-27.00	-21.74
13216.22	V	59.58	-35.65	-27.00	-8.65
7006.17	H	47.61	-47.62	-27.00	-20.62
10379.69	H	51.28	-43.95	-27.00	-16.95
13400.51	H	54.19	-41.04	-27.00	-14.04

Note: (1) All Readings are Peak Value (VBW=3MHz) and Peak Value (VBW=10Hz).

(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77

d is the measurement distance in 3 meters

● ☒ Undesirable radiated Spurious Emission in band edge

Temperature :	28°C	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	802.11n(HT20)	Frequency:	5745

Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5725.00	H	50.18	-45.05	-17	PASS
5724.75	V	48.39	-46.84	-17	PASS

Temperature :	28°C	Test Date :	2023-01-15
Humidity :	65 %	Test By:	Sunshine
Test mode:	802.11n(HT20)	Frequency:	5825

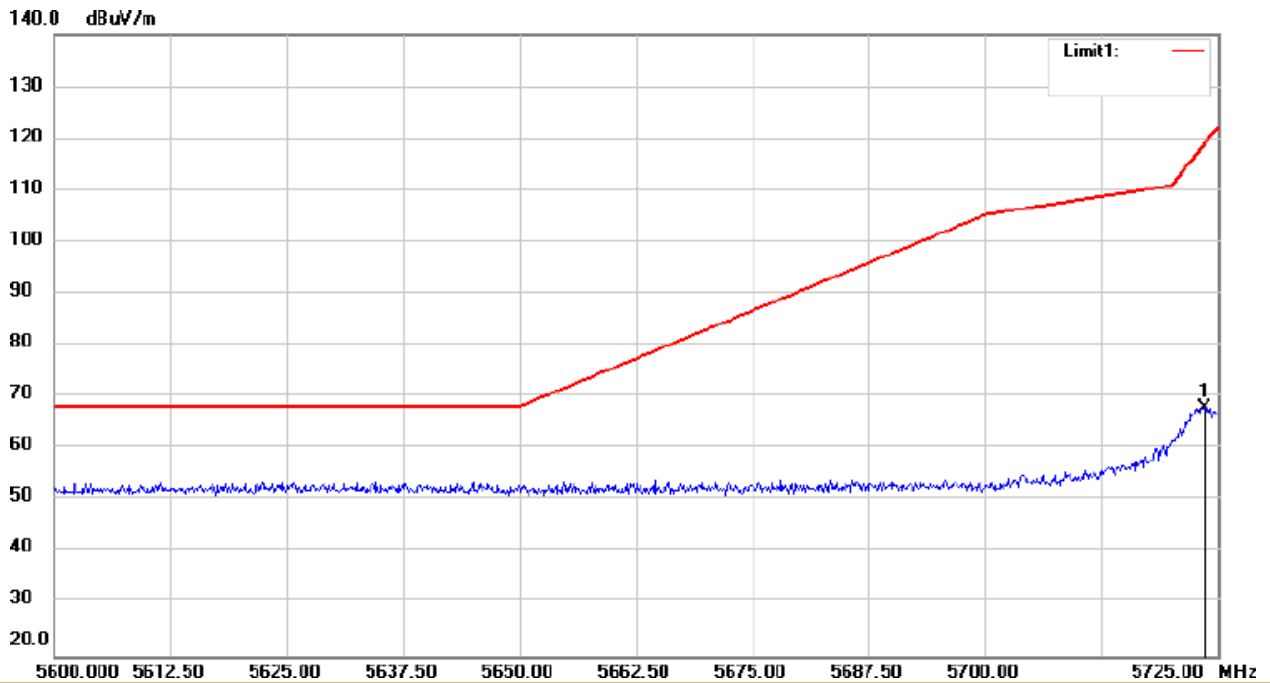
Freq. (MHz)	Ant.Pol. H/V	Field Strength (RBW=100KHz) (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Verdict
5881.75	H	51.76	-43.47	-17	PASS
5874.87	V	49.84	-45.39	-17	PASS

Note: (1) All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).

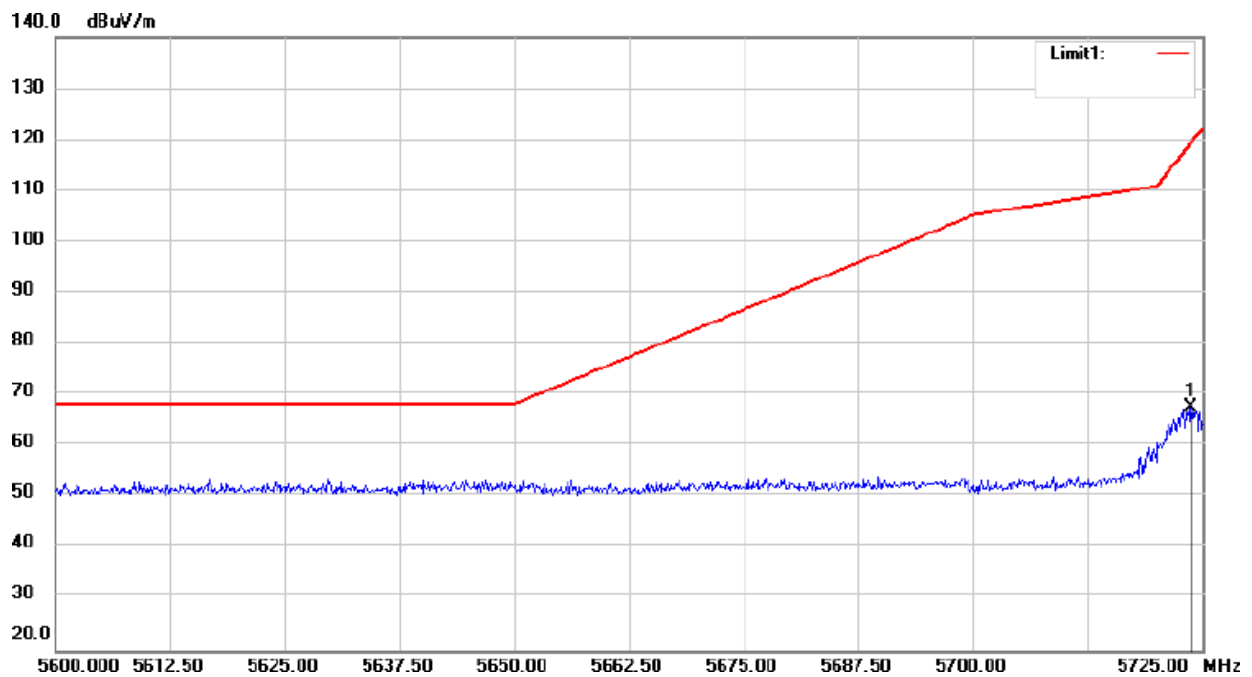
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.

(3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77
d is the measurement distance in 3 meters

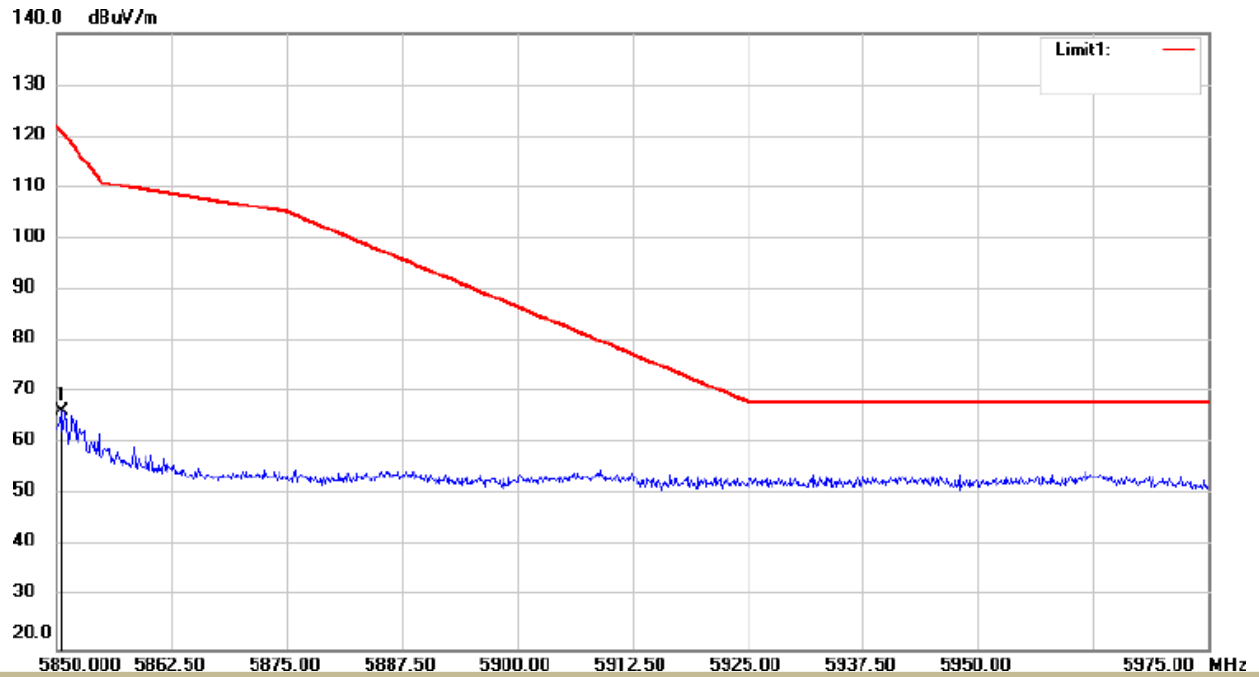
UNII Band III				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
		<input checked="" type="checkbox"/> 5745	Ant.Pol	H



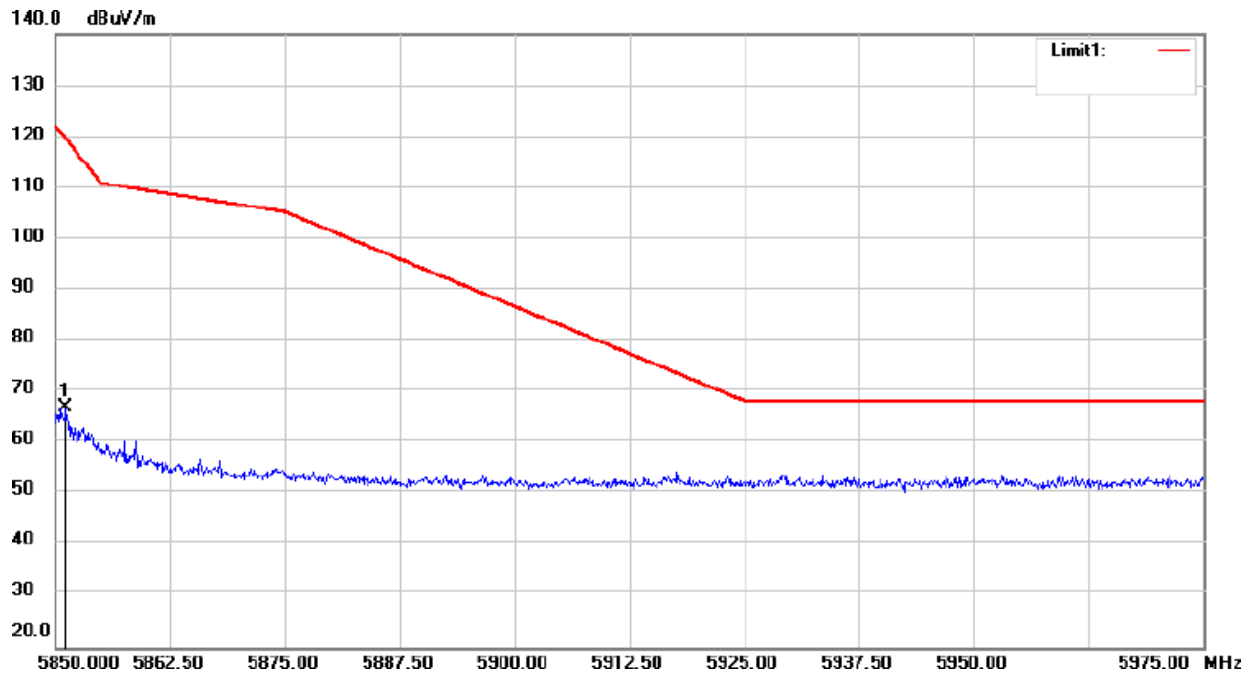
UNII Band III				
Test Model	Undesirable radiated	Undesirable radiated	Spurious Emission in Band Edge	
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
		<input checked="" type="checkbox"/> 5745	Ant.Pol	V



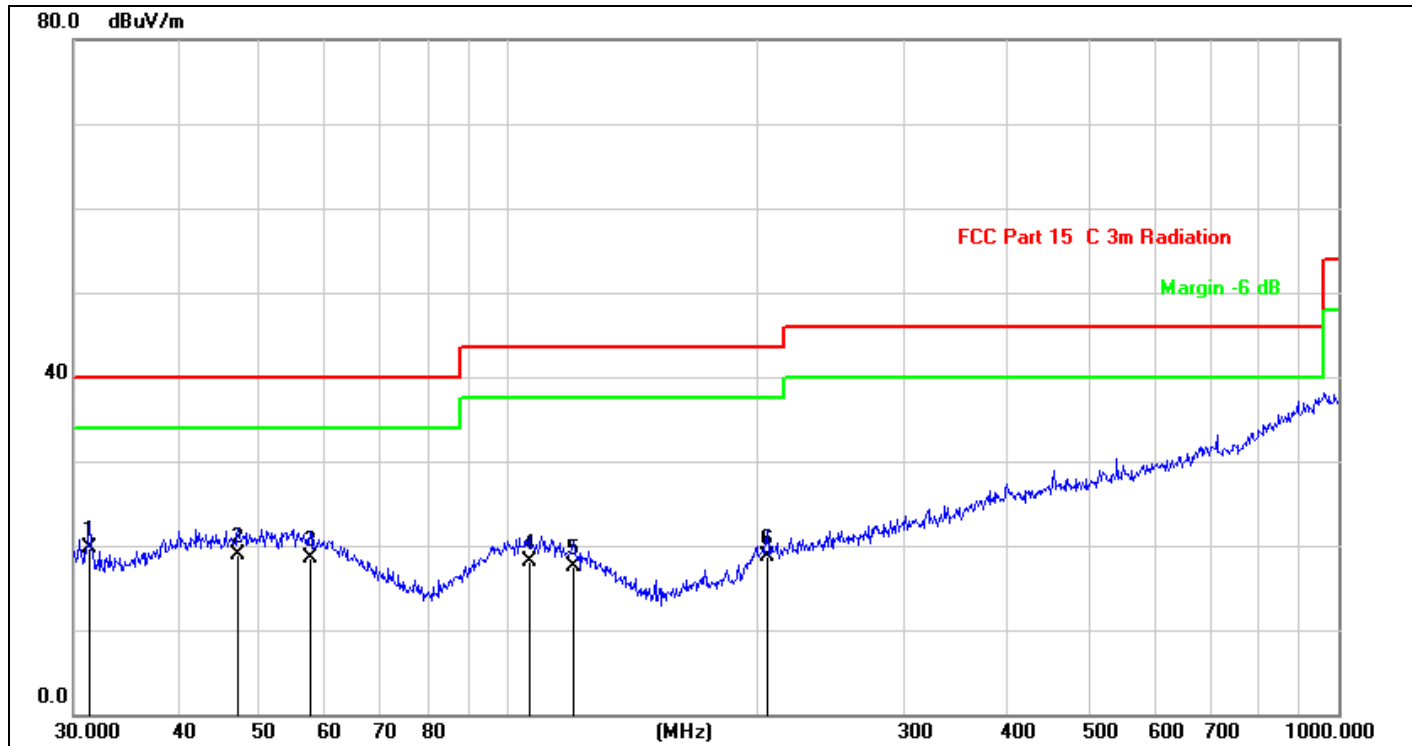
UNII Band III				
Test Model	Undesirable radiated		Undesirable radiated	
	Spurious Emission in Band Edge		Spurious Emission in Band Edge	
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
	<input checked="" type="checkbox"/> 5825		Ant.Pol	H



UNII Band III				
Test Model	Undesirable radiated		Undesirable radiated	
	Spurious Emission in Band Edge		Spurious Emission in Band Edge	
	<input type="checkbox"/> 802.11a	<input checked="" type="checkbox"/> 802.11n(HT20)	<input type="checkbox"/> 802.11n(HT40)	
	<input checked="" type="checkbox"/> 5825		Ant.Pol	V



- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)

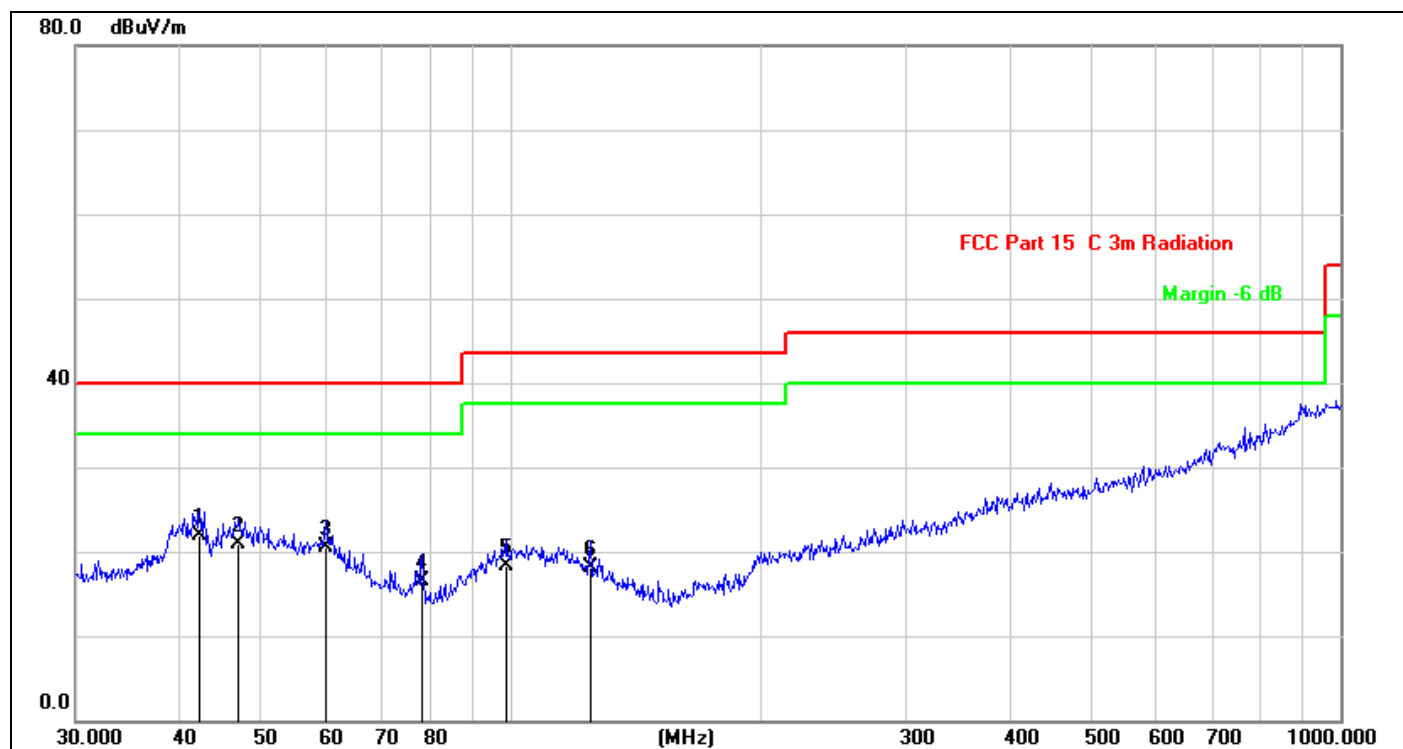


Site:	LAB	Antenna::Horizontal	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation	Test Time:	Humidity(%):60%
EUT:	10.3-INCH reader		2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5180	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1 *	31.3992	27.18	-7.48	19.70	40.00	-20.30	QP	
2	47.3255	23.26	-4.26	19.00	40.00	-21.00	QP	
3	57.7962	23.25	-4.65	18.60	40.00	-21.40	QP	
4	106.0126	22.85	-4.65	18.20	43.50	-25.30	QP	
5	119.8556	23.15	-5.55	17.60	43.50	-25.90	QP	
6	205.6751	23.75	-4.95	18.80	43.50	-24.70	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

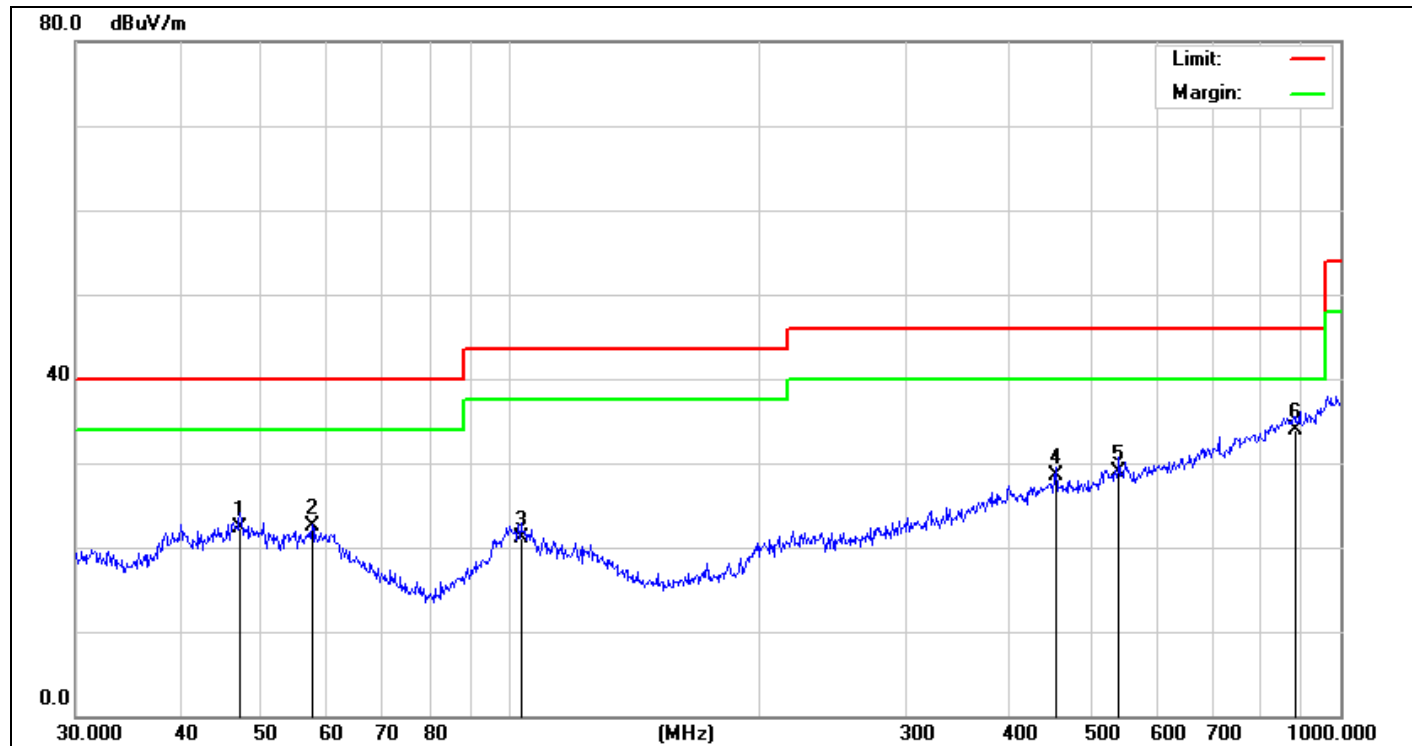
E01A2301024F00103



Site:	LAB	Antenna::Vertical	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%):60%
EUT:	10.3-INCH reader	Test Time:	2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5180	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1 *	42.3022	26.32	-4.42	21.90	40.00	-18.10	QP	
2	47.1599	25.17	-4.27	20.90	40.00	-19.10	QP	
3	60.0691	25.42	-4.82	20.60	40.00	-19.40	QP	
4	78.4133	27.28	-10.68	16.60	40.00	-23.40	QP	
5	98.8326	23.61	-5.21	18.40	43.50	-25.10	QP	
6	125.0066	24.57	-6.37	18.20	43.50	-25.30	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

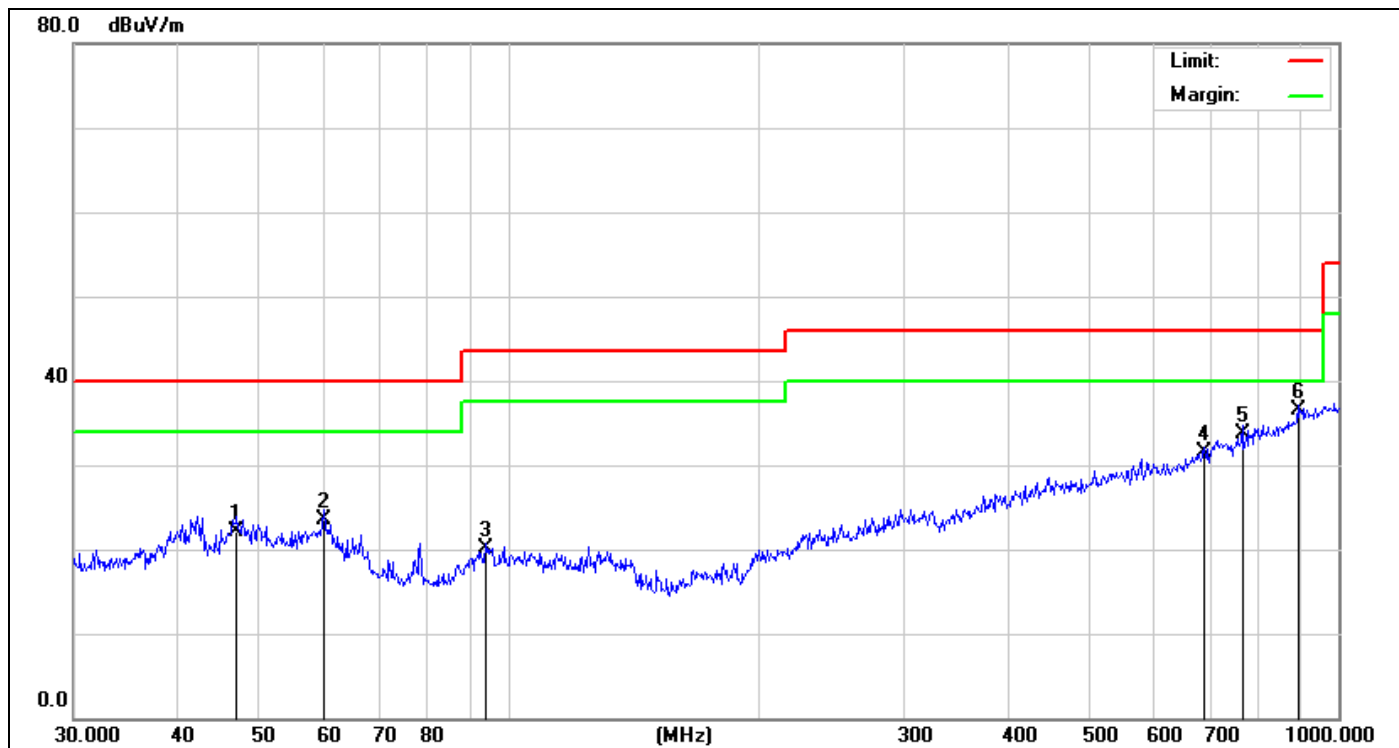


Site:	LAB	Antenna::Horizontal	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%):60%
EUT:	10.3-INCH reader	Test Time:	2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5200	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	47.3253	26.58	-4.26	22.32	40.00	-17.68	QP	
2	57.7961	27.14	-4.65	22.49	40.00	-17.51	QP	
3	103.0799	25.85	-4.78	21.07	43.50	-22.43	QP	
4	454.3100	27.33	1.19	28.52	46.00	-17.48	QP	
5	541.3721	26.81	2.07	28.88	46.00	-17.12	QP	
6 *	884.5027	24.14	9.67	33.81	46.00	-12.19	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

E01A2301024F00103

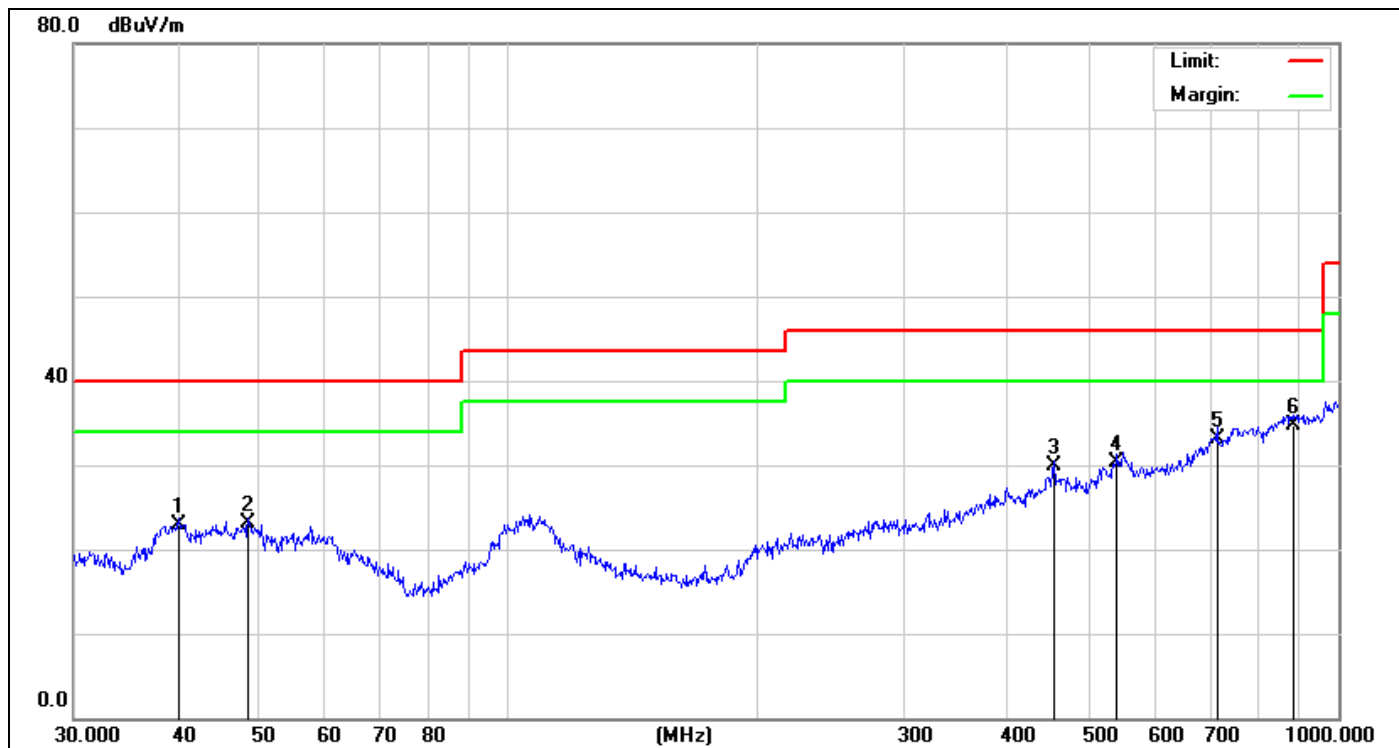


Site:	LAB	Antenna::Vertical	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%):60%
EUT:	10.3-INCH reader	Test Time:	2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5200	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	47.1599	26.32	-4.27	22.05	40.00	-17.95	QP	
2	60.0690	28.30	-4.82	23.48	40.00	-16.52	QP	
3	94.0978	26.54	-6.51	20.03	43.50	-23.47	QP	
4	689.5643	26.74	4.74	31.48	46.00	-14.52	QP	
5	766.0570	27.54	6.26	33.80	46.00	-12.20	QP	
6 *	893.8567	26.58	9.85	36.43	46.00	-9.57	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

E01A2301024F00103

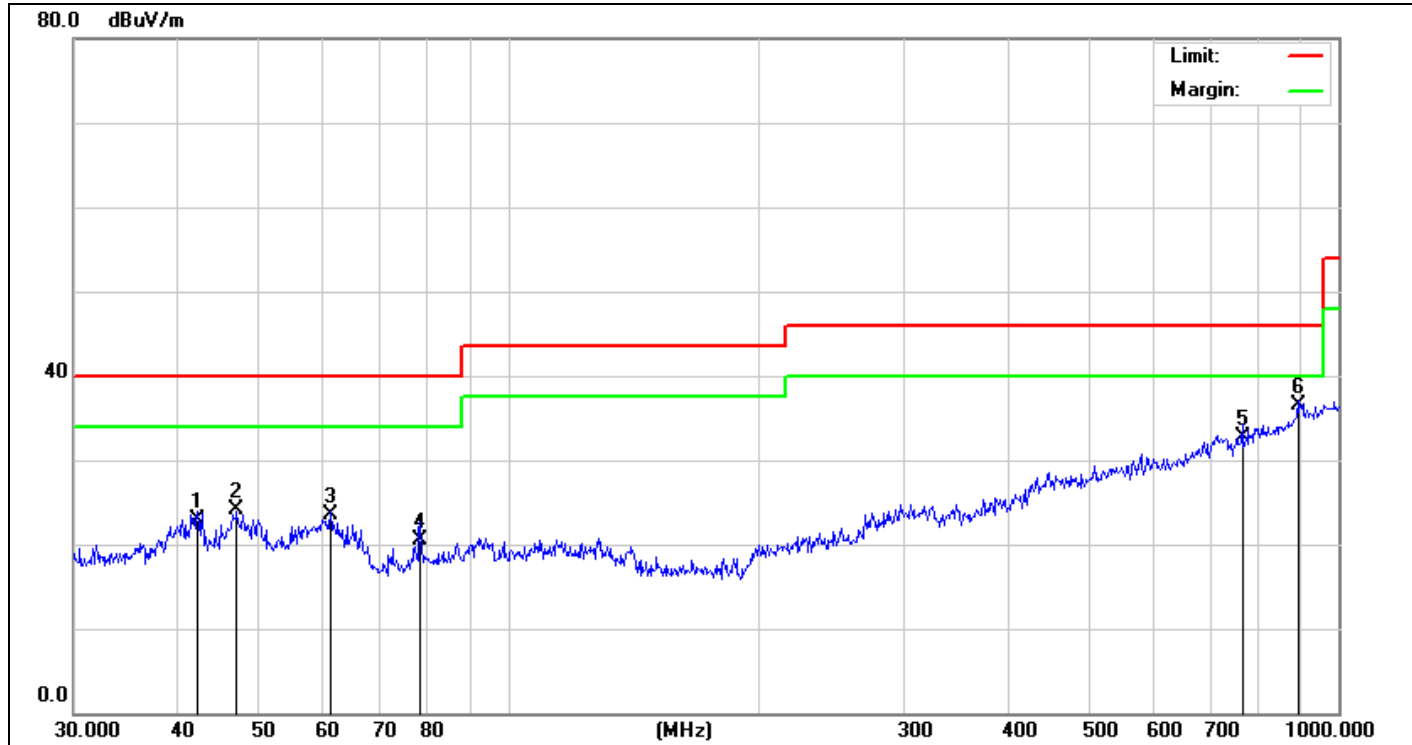


Site:	LAB	Antenna::Horizontal	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%):60%
EUT:	10.3-INCH reader	Test Time:	2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5240	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	40.1347	27.44	-4.50	22.94	40.00	-17.06	QP	
2	48.6719	27.41	-4.21	23.20	40.00	-16.80	QP	
3	454.3100	28.62	1.19	29.81	46.00	-16.19	QP	
4	541.3721	28.14	2.07	30.21	46.00	-15.79	QP	
5	714.1734	27.78	5.37	33.15	46.00	-12.85	QP	
6 *	881.4067	25.14	9.62	34.76	46.00	-11.24	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

E01A2301024F00103



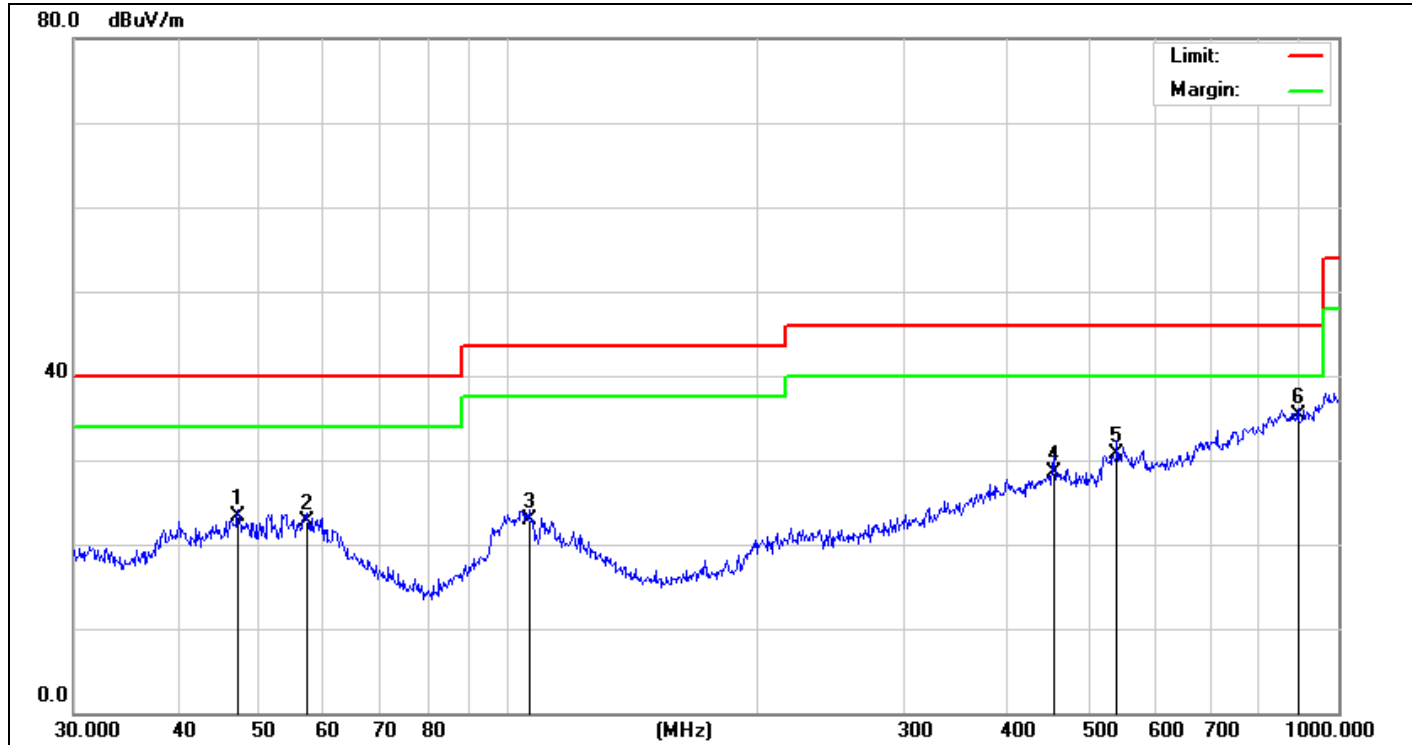
Site: LAB
Limit: FCC Part 15 C 3m Radiation
EUT: 10.3-INCH reader
M/N.: SHERD-01-9BA
Mode: TX5240
Note:

Antenna:: Vertical
Temperature(C): 26(C)
Humidity(%): 60%
Test Time: 2023-1-9
Power Rating: Battery 3.8V
Test Engineer: Dyson

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	42.3021	27.41	-4.42	22.99	40.00	-17.01	QP	
2	47.1599	28.47	-4.27	24.20	40.00	-15.80	QP	
3	61.1315	28.69	-5.24	23.45	40.00	-16.55	QP	
4	78.4133	31.25	-10.68	20.57	40.00	-19.43	QP	
5	766.0570	26.45	6.26	32.71	46.00	-13.29	QP	
6 *	893.8567	26.74	9.84	36.58	46.00	-9.42	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

E01A2301024F00103



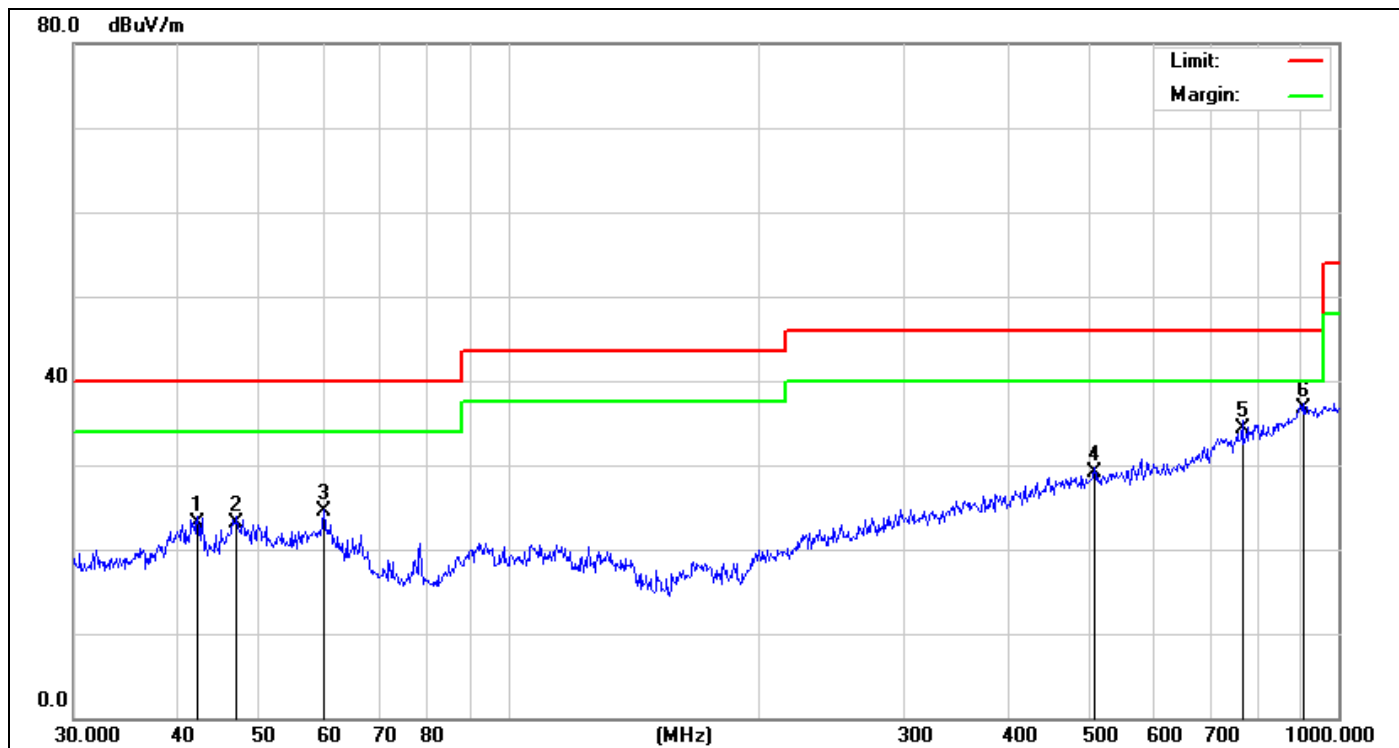
Site: LAB
Limit: FCC Part 15 C 3m Radiation
EUT: 10.3-INCH reader
M/N.: SHERD-01-9BA
Mode: TX5745
Note:

Antenna::Horizontal
Temperature(C):26(C)
Humidity(%):60%
Test Time: 2023-1-9
Power Rating: Battery 3.8V
Test Engineer: Dyson

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	47.3253	27.52	-4.26	23.26	40.00	-16.74	QP	
2	57.1914	27.41	-4.62	22.79	40.00	-17.21	QP	
3	106.0126	27.63	-4.65	22.98	43.50	-20.52	QP	
4	454.3100	27.41	1.19	28.60	46.00	-17.40	QP	
5	541.3721	28.69	2.07	30.76	46.00	-15.24	QP	
6 *	893.8567	25.55	9.84	35.39	46.00	-10.61	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

E01A2301024F00103

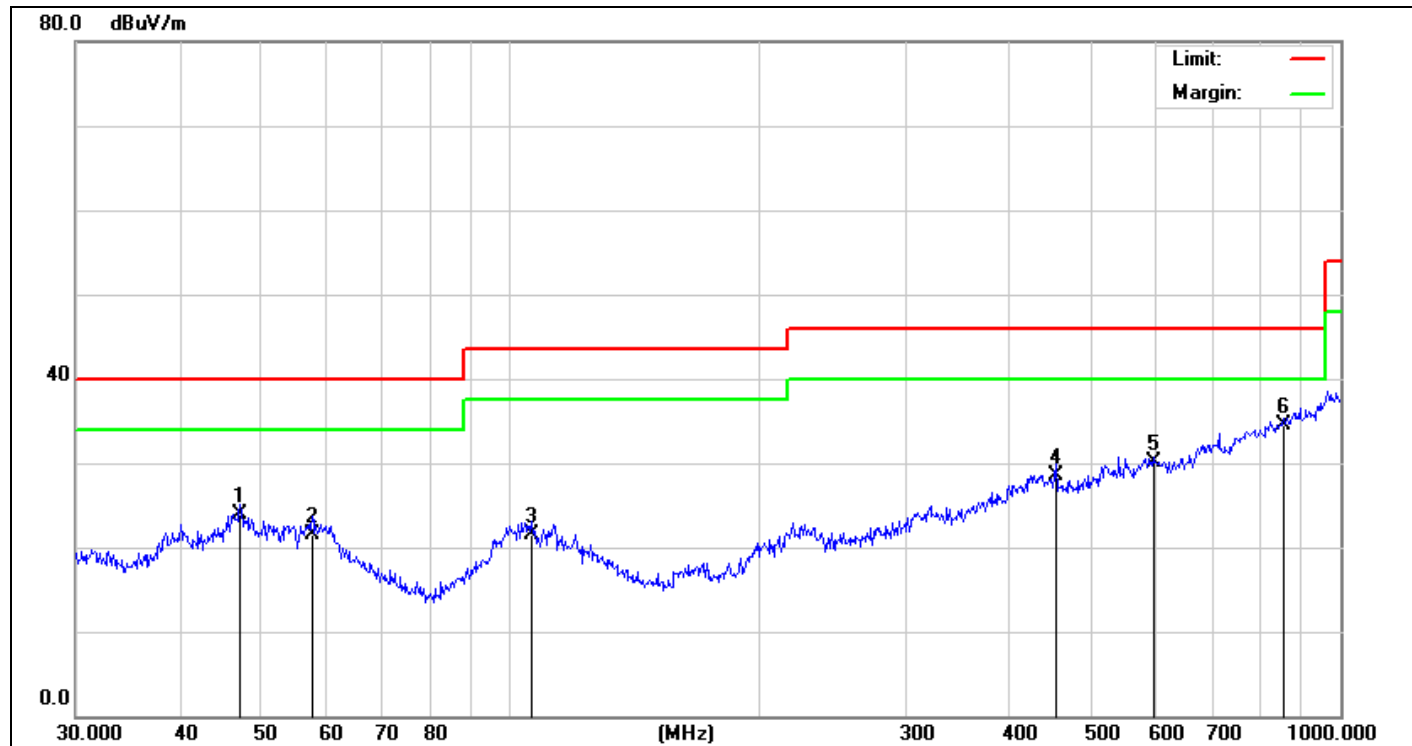


Site:	LAB	Antenna:: Vertical	Temperature(C): 26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%): 60%
EUT:	10.3-INCH reader	Test Time:	2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5745	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	42.3021	27.52	-4.42	23.10	40.00	-16.90	QP	
2	47.1599	27.41	-4.27	23.14	40.00	-16.86	QP	
3	60.0690	29.41	-4.82	24.59	40.00	-15.41	QP	
4	508.2581	27.46	1.56	29.02	46.00	-16.98	QP	
5	766.0570	27.96	6.26	34.22	46.00	-11.78	QP	
6 *	906.4823	26.58	10.07	36.65	46.00	-9.35	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

E01A2301024F00103

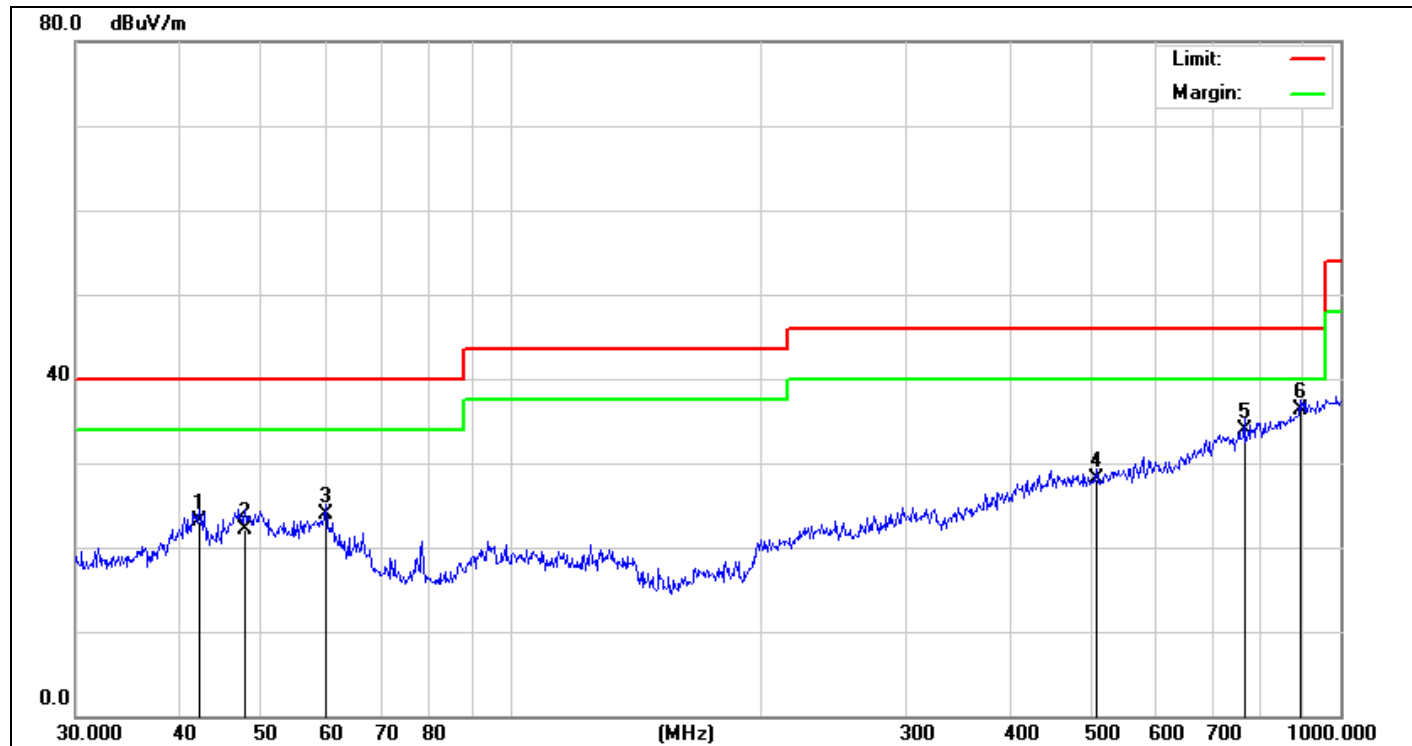


Site:	LAB	Antenna::Horizontal	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation	Test Time:	Humidity(%):60%
EUT:	10.3-INCH reader	Power Rating:	2023-1-9
M/N.:	SHERD-01-9BA	Test Engineer:	Battery 3.8V
Mode:	TX5785		Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	47.3253	28.14	-4.26	23.88	40.00	-16.12	QP	
2	57.7961	26.15	-4.65	21.50	40.00	-18.50	QP	
3	106.0126	26.25	-4.65	21.60	43.50	-21.90	QP	
4	454.3100	27.41	1.19	28.60	46.00	-17.40	QP	
5	595.1326	27.25	2.82	30.07	46.00	-15.93	QP	
6 *	854.0247	25.96	8.55	34.51	46.00	-11.49	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

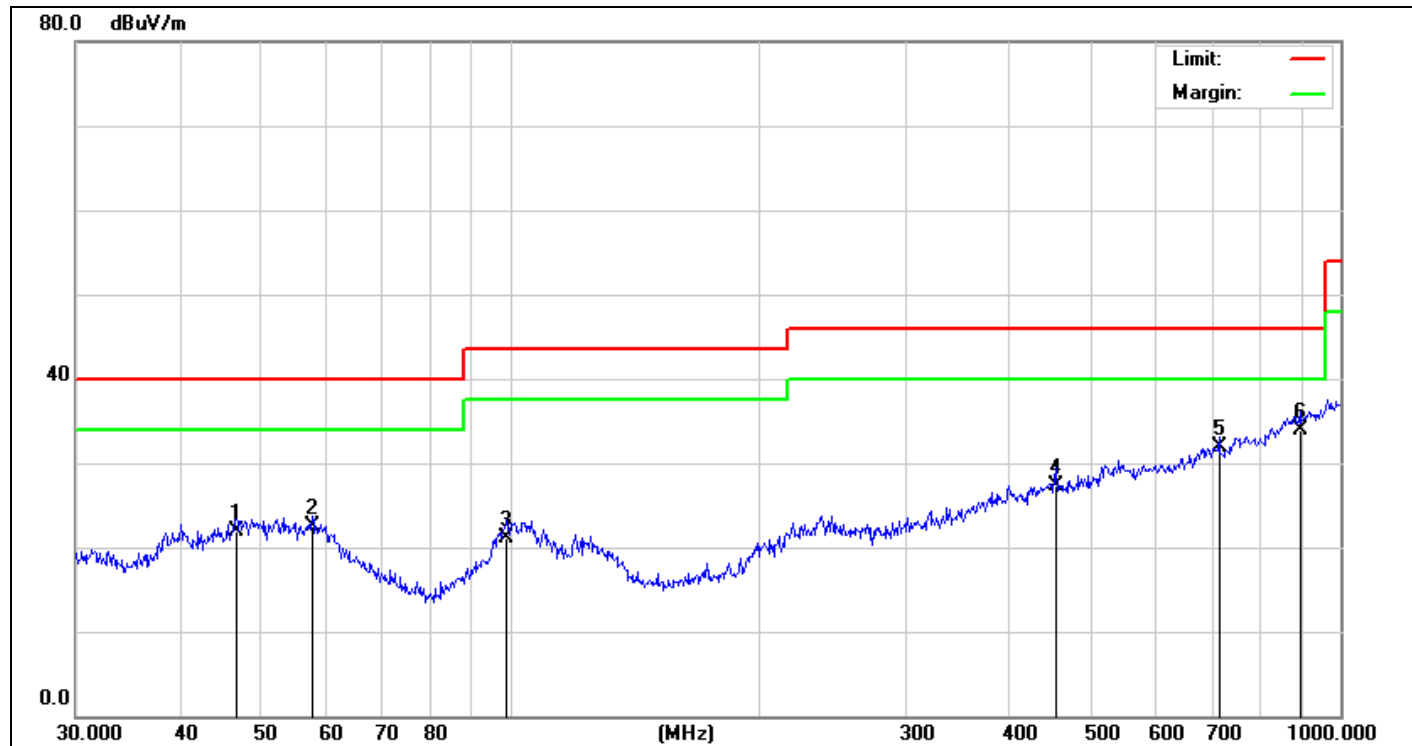
E01A2301024F00103



Site:	LAB	Antenna::Vertical	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%):60%
EUT:	10.3-INCH reader	Test Time:	2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5785	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	42.3021	27.52	-4.42	23.10	40.00	-16.90	QP	
2	47.9938	26.38	-4.23	22.15	40.00	-17.85	QP	
3	60.0690	28.66	-4.82	23.84	40.00	-16.16	QP	
4	508.2581	26.51	1.56	28.07	46.00	-17.93	QP	
5	766.0570	27.58	6.26	33.84	46.00	-12.16	QP	
6 *	893.8567	26.52	9.84	36.36	46.00	-9.64	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

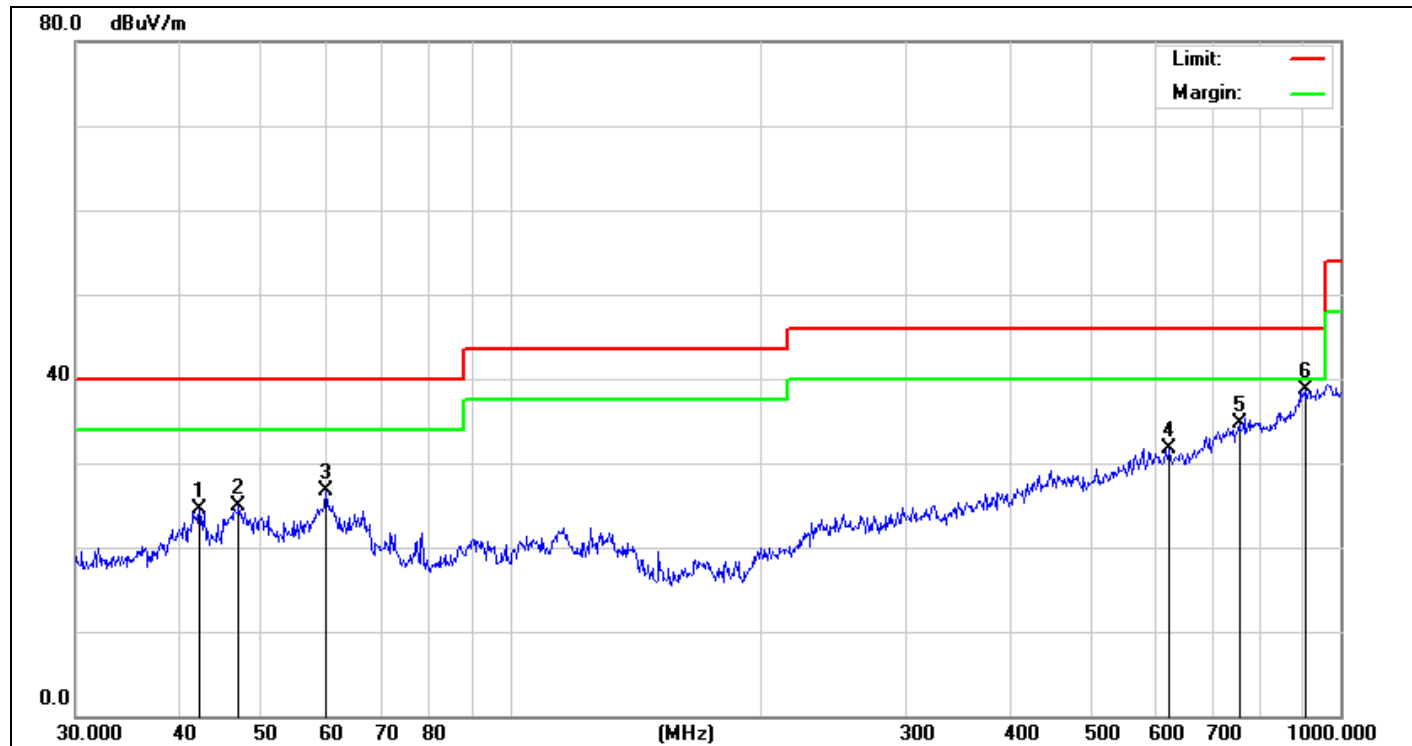


Site:	LAB	Antenna::Horizontal	Temperature(C):26(C)
Limit:	FCC Part 15 C 3m Radiation	Test Time:	Humidity(%):60%
EUT:	10.3-INCH reader	Power Rating:	2023-1-9
M/N.:	SHERD-01-9BA	Test Engineer:	Battery 3.8V
Mode:	TX5825		Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	46.8303	26.25	-4.27	21.98	40.00	-18.02	QP	
2	57.7961	27.14	-4.65	22.49	40.00	-17.51	QP	
3	99.1795	26.25	-5.13	21.12	43.50	-22.38	QP	
4	454.3100	26.14	1.19	27.33	46.00	-18.67	QP	
5	714.1734	26.58	5.37	31.95	46.00	-14.05	QP	
6 *	893.8567	24.14	9.84	33.98	46.00	-12.02	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

E01A2301024F00103



Site:	LAB	Antenna:: Vertical	Temperature(C): 26(C)
Limit:	FCC Part 15 C 3m Radiation		Humidity(%): 60%
EUT:	10.3-INCH reader	Test Time:	2023-1-9
M/N.:	SHERD-01-9BA	Power Rating:	Battery 3.8V
Mode:	TX5825	Test Engineer:	Dyson
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Remark
1	42.3021	28.86	-4.42	24.44	40.00	-15.56	QP	
2	47.1599	29.25	-4.27	24.98	40.00	-15.02	QP	
3	60.0690	31.48	-4.82	26.66	40.00	-13.34	QP	
4	622.8899	28.54	3.13	31.67	46.00	-14.33	QP	
5	755.3872	28.50	6.14	34.64	46.00	-11.36	QP	
6 *	906.4823	28.65	10.07	38.72	46.00	-7.28	QP	

Note: 1. Result Level = Read Level+ Antenna Factor+ Cable Loss- Amp. Factor

8.6 POWER LINE CONDUCTED EMISSIONS

8.6.1 Applicable Standard

According to FCC Part 15.207(a)

8.6.2 Conformance Limit

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

8.6.3 Test Configuration

Test according to clause 6.3 conducted emission test setup

8.6.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

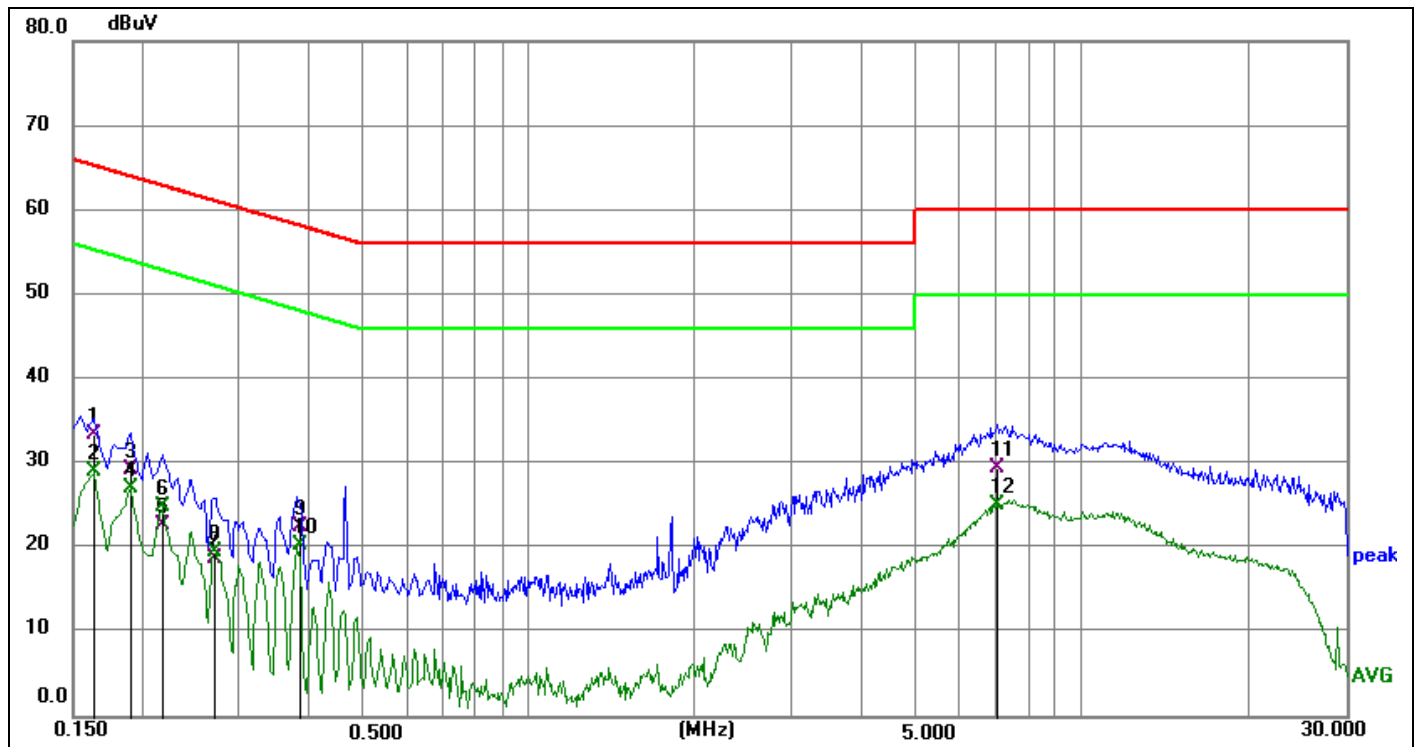
Repeat above procedures until all frequency measured were complete.

8.6.5 Test Results

Pass

We test the EUT AC 120V, and show the worst result as bellow.

E01A2301024F00103

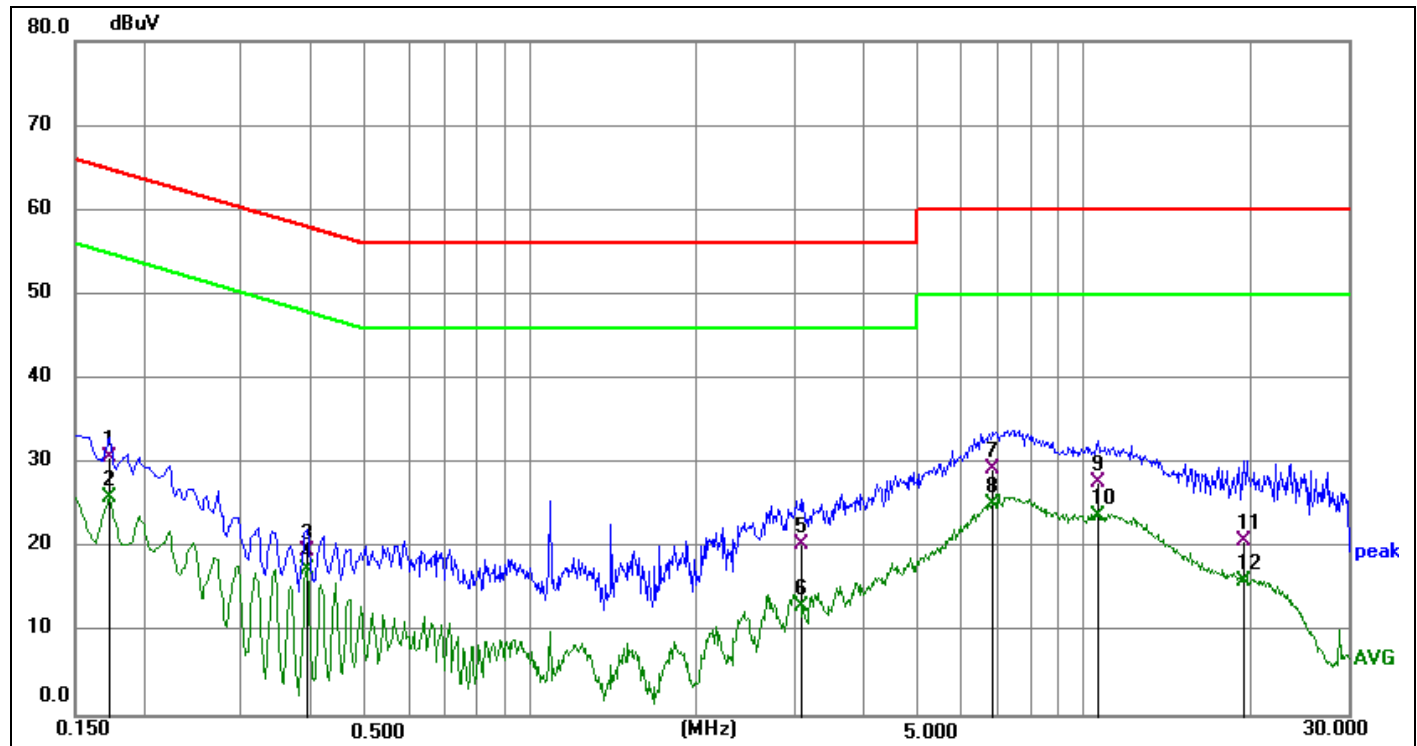


Site:	843	Phase:	L1	Temperature(C):	26(C)
Limit:	FCC PART 15C Conduction(QP)	Test Time:	2023-1-9	Humidity(%):	60%
EUT:	10.3-INCH reader	Power Rating:	AC 120V/60Hz		
M/N.:	SHERD-01-9BA	Test Engineer:	Sunshine		
Mode:	WIFI TX5180				
Note:					

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.1635	23.75	9.62	33.37	65.28	-31.91	QP	
2	0.1635	19.42	9.62	29.04	55.28	-26.24	AVG	
3	0.1905	19.54	9.66	29.20	64.01	-34.81	QP	
4	0.1905	17.51	9.66	27.17	54.01	-26.84	AVG	
5	0.2175	13.17	9.55	22.72	62.91	-40.19	QP	
6	0.2175	15.43	9.55	24.98	52.91	-27.93	AVG	
7	0.2714	9.31	9.53	18.84	61.07	-42.23	QP	
8	0.2714	10.09	9.53	19.62	51.07	-31.45	AVG	
9	0.3846	12.86	9.77	22.63	58.18	-35.55	QP	
10	0.3846	10.64	9.77	20.41	48.18	-27.77	AVG	
11	7.0539	19.37	10.09	29.46	60.00	-30.54	QP	
12	7.0539	15.04	10.09	25.13	50.00	-24.87	AVG	

*:Maximum data x:Over limit !:over margin

E01A2301024F00103



Site:	843	Phase:	N	Temperature(C):	26(C)
Limit:	FCC PART 15C Conduction(QP)	Test Time:	2023-1-9	Humidity(%):	60%
EUT:	10.3-INCH reader	Power Rating:	AC 120V/60Hz		
M/N.:	SHERD-01-9BA	Test Engineer:	Sunshine		
Mode:	WIFI TX5180				
Note:					

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.1725	21.21	9.53	30.74	64.84	-34.10	QP	
2	0.1725	16.30	9.53	25.83	54.84	-29.01	AVG	
3	0.3930	9.68	9.84	19.52	58.00	-38.48	QP	
4	0.3930	7.62	9.84	17.46	48.00	-30.54	AVG	
5	3.0750	10.22	10.06	20.28	56.00	-35.72	QP	
6	3.0750	3.02	10.06	13.08	46.00	-32.92	AVG	
7	6.8487	19.18	10.15	29.33	60.00	-30.67	QP	
8	6.8487	15.05	10.15	25.20	50.00	-24.80	AVG	
9	10.5938	17.58	10.07	27.65	60.00	-32.35	QP	
10	10.5938	13.62	10.07	23.69	50.00	-26.31	AVG	
11	19.5135	10.34	10.33	20.67	60.00	-39.33	QP	
12	19.5135	5.74	10.33	16.07	50.00	-33.93	AVG	

*:Maximum data x:Over limit !:over margin

8.7 ANTENNA APPLICATION

8.7.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 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 use of a standard antenna Sunshine or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

8.7.2 Result

PASS.

The EUT has a FPC antenna for WIFI 2.4 Band, the max gain is 2.14 dBi;

The EUT has a FPC antenna: for WIFI 5G Band, the max gain is 2.04 dBi for WIFI 5G Band I, and the max gain is 2.4dBi for WIFI 5G Band III.

- Note:
- ☒ Antenna use a permanently attached antenna which is not replaceable.
 - ☐ Not using a standard antenna Sunshine or electrical connector for antenna replacement
 - ☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.