



# RF TEST REPORT

**Report No.:** 20240917G19292X-W3

**Product Name:** Color Doppler Ultrasound Diagnostic System

**Model No.:** CMS1600B

**FCC ID:** 2ABOGCMS1600B

**Applicant:** Contec Medical Systems Co., Ltd.

No.112 Qinhuang West Street, Economic & Technical Development

**Address:** Zone, Qinhuangdao, Hebei Province, PEOPLE'S REPUBLIC OF CHINA

**Dates of Testing:** 06/10/2024 - 08/09/2024

**Issued by:** CCIC Southern Testing Co., Ltd.

**Lab Location:** Electronic Testing Building, No.43, Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China.

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## Test Report

**Product** .....: Color Doppler Ultrasound Diagnostic System

**Brand Name** .....: **CONTEC**

**Trade Name** .....: **CONTEC**

**Applicant**.....: Contec Medical Systems Co., Ltd.

**Applicant Address**.....: No.112 Qinhuang West Street, Economic & Technical  
Development Zone, Qinhuangdao, Hebei Province,  
PEOPLE'S REPUBLIC OF CHINA

**Manufacturer** .....: Contec Medical Systems Co., Ltd.

**Manufacturer Address** .....: No.112 Qinhuang West Street, Economic & Technical  
Development Zone, Qinhuangdao, Hebei Province,  
PEOPLE'S REPUBLIC OF CHINA

**Test Standards** .....: 47 CFR Part 15 Subpart E 15.407  
ANSI C63.10-2020

**Test Result**.....: Pass

**Tested by** .....: Kim Li 2024.08.20  
Kim Li, Test Engineer

**Reviewed by** .....: Sun Jiaohui 2024.08.20  
Sun Jiaohui, Senior Engineer

**Approved by** .....: Chris You 2024.08.20  
Chris You, Manager

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Change History		
Issue	Date	Reason for change
1.0	2024.08.20	First edition

## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Color Doppler Ultrasound Diagnostic System
Model No.	CMS1600B
Hardware Version	1.0
Software Version	V1.0
EUT supports Radios application	WLAN5.0GHz 802.11n
Product Type	Client devices
Modulation Type	802.11n: OFDM (BPSK/QPSK/16QAM/64QAM)
Transfer Rate	802.11n: up to 72.2 Mbps
Frequency Range	UNII-3: 5725 ~ 5850MHz
Channel Bandwidth	802.11n: 20MHz
Channel Number	UNII-3: 5 for 802.11n(HT20)
Antenna Type	Chip Antennas
Antenna Gain	2.4dBi
Output Power (Max.)	6.54dBm
Test Control Software	ADB
Power supply	Rechargeable Li-ion Polymer Battery DC3.85V/2800mAh

Note 1: The information of antenna gain and cable loss is provided by the manufacturer and our lab is not responsible for the accuracy of the antenna gain and cable loss information.

## 1.2. Test Standards and Results

The purpose of the report is to conduct testing according to the following FCC certification standards:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart E §15.407	Radio Frequency Devices
2	KDB789033 D02 General UNII Test Procedures New Rules v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
3	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
4	ANSI C63.10-2020	American National Standard for Testing Unlicensed Wireless Devices

Test detailed items/section required by FCC rules and results are as below:

No.	FCC Rule	Description	Result
1	15.203 15.407(a)	Antenna Requirement	PASS
2	15.407(a)(3)(i)	Maximum Conducted Output Power	PASS
3	15.407(a)(12)	26dB Emission Bandwidth 99% Occupied Bandwidth	PASS
4	15.407(e)	6dB Emission Bandwidth	PASS
5	15.407(a)(3)(i)	Power spectral density (PSD)	PASS
6	15.207	AC Power Line Conducted Emission	PASS
7	15.205 15.209 15.407(b)(4)	Radiated Band Edges and Spurious Emission	PASS
8	15.407(g)	Frequency Stability	PASS

### 1.3. Channel List

#### Operated band in 5725 MHz ~ 5850MHz

5 channels are provided for 802.11n-HT20.

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

### 1.4. Test environment and mode

During the measurement, the environmental conditions were within the listed ranges:

Operating Environment	
Temperature	15 °C - 35 °C
Humidity	30% -60%
Atmospheric Pressure	86kPa-106kPa

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

For Frequency band 5725 ~ 5850 MHz				
Test Mode	Frequency(MHz)			Data rate
	LCH	MCH	HCH	
802.11n-HT20	5745	5785	5825	MCS 0
Note: After scanning all modulation types and data rates for all test patterns, the above list was found to be the worst case.				

### 1.5. Table for Supporting Units

No.	Equipment	Brand Name	Model Name	Manufacturer	Serial No.	Note
1	Laptop	HP	TPN-Q221	HP	5CD14347QB	FCC DOC



## **1.6. Laboratory Facilities**

### **FCC-Registration No.: CN1283**

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until Jun. 30th, 2025.

### **ISED Registration: 11185A**

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A on Aug. 04, 2016, valid time is until Jun. 30th, 2025.

### **CAB number: CN0064**

### **A2LA Code: 5721.01**

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

## 2. 47 CFR Part 15E Requirements

### 2.1. Antenna requirement

#### 2.1.1. Applicable Standard

According to FCC 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.

According to FCC 15.407(a)(1): For client devices in the 5.15-5.25 GHz 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.

According to FCC 15.407(a)(2): For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, 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.

According to FCC 15.407(a)(3): For the band 5.725-5.850 GHz, 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.

#### 2.1.2. Antenna Information

**Antenna Category:** Chip Antennas

A chip antenna was soldered to the antenna port of EUT via an adaptor cable, can't be removed.

**Antenna General Information:**

EUT	Operating frequency range	Ant. Type	Ant. Gain
Color Doppler Ultrasound Diagnostic System	UNII-3	Chip Antennas	2.4dBi

#### 2.1.3. Result: comply

The EUT has two permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.



## 2.2. Maximum Conducted Output Power

### 2.2.1. Limit of Maximum Conducted Output Power

#### FCC Part 15.407(a):

The maximum conducted output power should not exceed:

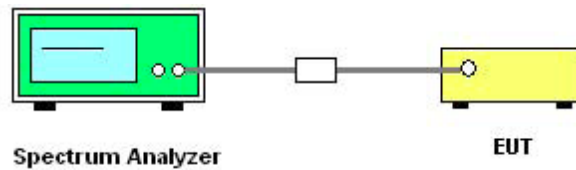
Band	EUT Category	Limit
U-NII-1	<input type="checkbox"/> Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21dBm) at any elevation angle above 30 degrees as measured from the horizon)
	<input type="checkbox"/> Fixed point-to-point Access device	1 Watt (30 dBm)
	<input type="checkbox"/> Indoor Access Point	1 Watt (30 dBm)
	<input checked="" type="checkbox"/> Mobile and portable client device	250mW (24 dBm)
U-NII-2A	<input checked="" type="checkbox"/>	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-2C	<input checked="" type="checkbox"/>	250mW (24 dBm) or 11dBm+10logB* Whichever is less.
U-NII-3	<input checked="" type="checkbox"/>	1 Watt (30 dBm)

Note: B\* is the 26 dB emission bandwidth in MHz.

### 2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.2.3. Test Setup



### 2.2.4. Test Procedures

1. The testing follows the of KDB 789033 D02 v02r01 Section II.E.2.b and ANSI C63.10-2020 Section 12.3.2.2.
2. The RF output of EUT was connected to spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Power is calculated by integrating over the spectrum of the entire 99% OBW signal using the instrument's band power measurement feature.
4. Set span to encompass the entire 99% OBW of the signal.
5. Set RBW = 1MHz, VBW  $\geq$  3MHz, Sweep time = Auto, Detector = power averaging (RMS).

6. Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ .
7. Trace average at least 100 traces in power averaging (rms) mode.
8. Replace the EUT center frequency and repeat steps 3~7.

#### **2.2.5. Test Results of Maximum Conducted Output Power**

Please refer to APPENDIX A for detail.

## 2.3. Power spectral density (PSD)

### 2.3.1. Limit of Power Spectral Density

#### FCC Part 15.407(a)

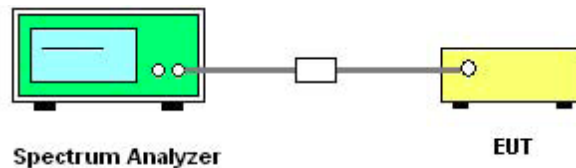
The maximum power spectral density should not exceed:

Band	EUT Category	Limit
U-NII-1	<input type="checkbox"/> Outdoor Access Point	17 dBm/MHz
	<input type="checkbox"/> Fixed point-to-point Access device	
	<input type="checkbox"/> Indoor Access Point	
	<input checked="" type="checkbox"/> Mobile and portable client device	11 dBm/MHz
U-NII-2A	<input checked="" type="checkbox"/>	11 dBm/MHz
U-NII-2C	<input checked="" type="checkbox"/>	11 dBm/MHz
U-NII-3	<input checked="" type="checkbox"/>	30dBm/500kHz

### 2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.3.3. Test Setup



### 2.3.4. Test Procedures

1. The testing follows the of KDB 789033 D02 v02r01 Section II.F and ANSI C63.10-2020 Section 12.5.
2. The RF output of EUT was connected to spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set span to encompass the entire 99% OBW of the signal.
4. For U-NII-1, U-NII-2a, U-NII-2c Band: Set RBW = 1MHz, VBW  $\geq$  3MHz, Sweep time = Auto, Detector = power averaging (RMS).
5. For U-NII-3 Band: Set RBW = 500kHz, VBW  $\geq$  2MHz, Sweep time = Auto, Detector = power averaging (RMS).
6. Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ .
7. Trace average at least 100 traces in power averaging (rms) mode.
8. Use the peak search function on the instrument to find the peak of the spectrum.



9. Replace the EUT center frequency and repeat steps 3~8.

### **2.3.5. Test Result of Power Spectral Density**

Please refer to APPENDIX A for detail.

## 2.4. 26dB Emission Bandwidth and 99% Occupied Bandwidth

### 2.4.1. Limit of 26dB Emission Bandwidth and 99% Occupied Bandwidth

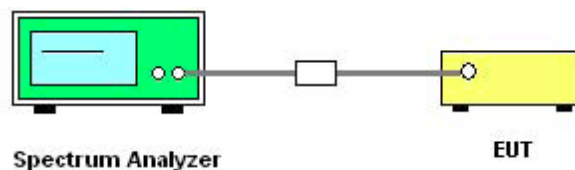
26dB Emission Bandwidth and 99% Occupied Bandwidth no Bandwidth limit.

The minimum 6dB bandwidth of U-NII-3 shall be at least 500 kHz.

### 2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.4.3. Test Description



### 2.4.4. Test Procedures

1. The testing follows the of KDB 789033 D02 v02r01 Section II.C.D and ANSI C63.10-2020 Section 12.4.
2. The RF output of EUT was connected to spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Use the spectrum analyzer “Channel Bandwidth” function to easurement the 26dB EBW, 6dB EBW and 99% OBW.
4. Set center frequency to the nominal EUT channel center frequency.
5. Set span = 1.5 times to 5.0 times the OBW or EBW.
6. For 26dB EBW and 99% OBW Measurement:  
Set RBW = approximately 1% EBW or 1.5 times to 5.0 times the OBW,  $VBW \geq 3 \times RBW$ .
7. For 6dB EBW Measurement:  
Set RBW =100kHz,  $VBW \geq 3 \times RBW$ .
8. Set Detector = Peak, Trace mode = max hold and Sweep time = auto couple.
9. Allow the trace to stabilize.
10. Replace the EUT center frequency and repeat steps 3~9.

### 2.4.5. Test Results of 26dB Emission Bandwidth and 99% Occupied Bandwidth

Please refer to APPENDIX A for detail.

## 2.5. Frequency Stability

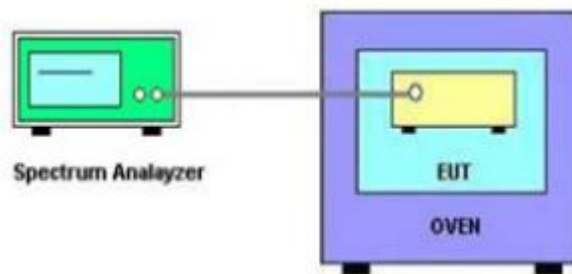
### 2.5.1. Limit of Frequency Stability

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.

### 2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.5.3. Test Setup



### 2.5.4. Test Procedures

1. The testing follows the of KDB 789033 D02 v02r01 Section II.A.3 and ANSI C63.10-2020 Section 6.8.
2. The EUT is installed in an environment test chamber with external power source, was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set the chamber to operate at 50 °C and external power source to output at nominal voltage of EUT.
5. A sufficient stabilization period at each temperatures in used prior to each frequency measurement.
6. The test shall be performed under -30 °C to 50 °C and 85% to 115% of the nominal voltage. Change setting of chamber and external power source to complete all conditions.
7. Replace the EUT center frequency and repeat steps 3~6.

### 2.5.5. Test Result of Frequency Stability

Please refer to APPENDIX A for detail.

## 2.6. Radiated Band Edge and Spurious Emission

### 2.6.1. Limit of Radiated Band Edges and Spurious Emission

Radiated emission which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ )	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level ( $\mu\text{V/m}$ ).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

#### Limits of unwanted emission out of the restricted bands

FCC Part 15.407(b)			
Frequency Band (MHz)	Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength @3m (dB $\mu\text{V/m}$ )
5150 - 5250	Outside of the 5.15~5.35 GHz	-27	68.2
5725 - 5850	< 5650	-27	68.2
	5650~5700	-27~10	68.2~105.2
	5700~5720	10~15.6	105.2~110.8
	5720~5725	15.6~27	110.8~122.2
	5850~5855	27~15.6	122.2~110.8
	5855~5875	15.6~10	110.8~105.2
	5875~5925	10~-27	105.2~68.2
	> 5925	-27	68.2

Note:

- 1)  $\text{EIRP}[\text{dBm}] = \text{E}[\text{dB } \mu\text{V/m}] + 20 \log (\text{d}[\text{m}]) - 104.77$ , d is the measurement distance in m.
- 2)  $\text{E}[\text{dB } \mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2 = 68.2 \text{ dBuV/m}$ , for  $\text{EIRP}[\text{dBm}] = -27\text{dBm}$ .  
 $\text{E}[\text{dB } \mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2 = 105.2 \text{ dBuV/m}$ , for  $\text{EIRP}[\text{dBm}] = 10\text{dBm}$ .  
 $\text{E}[\text{dB } \mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2 = 110.8 \text{ dBuV/m}$ , for  $\text{EIRP}[\text{dBm}] = 15.6\text{dBm}$ .  
 $\text{E}[\text{dB } \mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2 = 122.2 \text{ dBuV/m}$ , for  $\text{EIRP}[\text{dBm}] = 27\text{dBm}$ .

Applicable To	Limit	
KDB 789033 D02 General UNII Test Procedures New Rules v02r01	Field Strength at 3m	
	PK: 68.2(dBμV/m)	AV: 54 (dBμV/m)

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	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	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	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	( <sup>2</sup> )
13.36-13.41	/	/	/

Note: <sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.  
<sup>2</sup>Above 38.6.

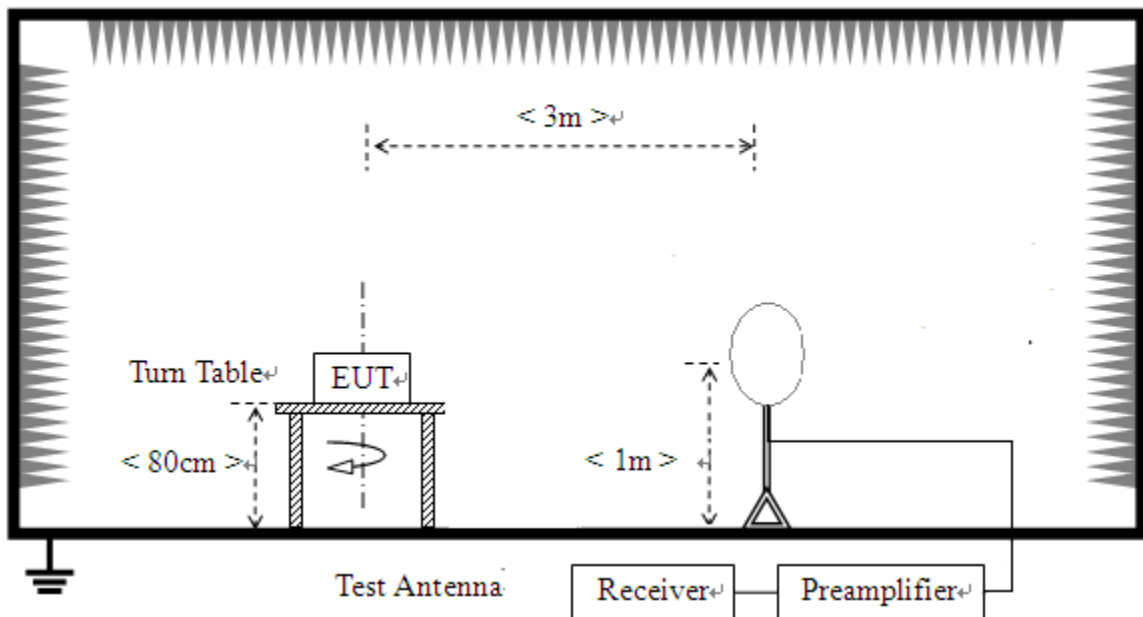
## 2.6.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

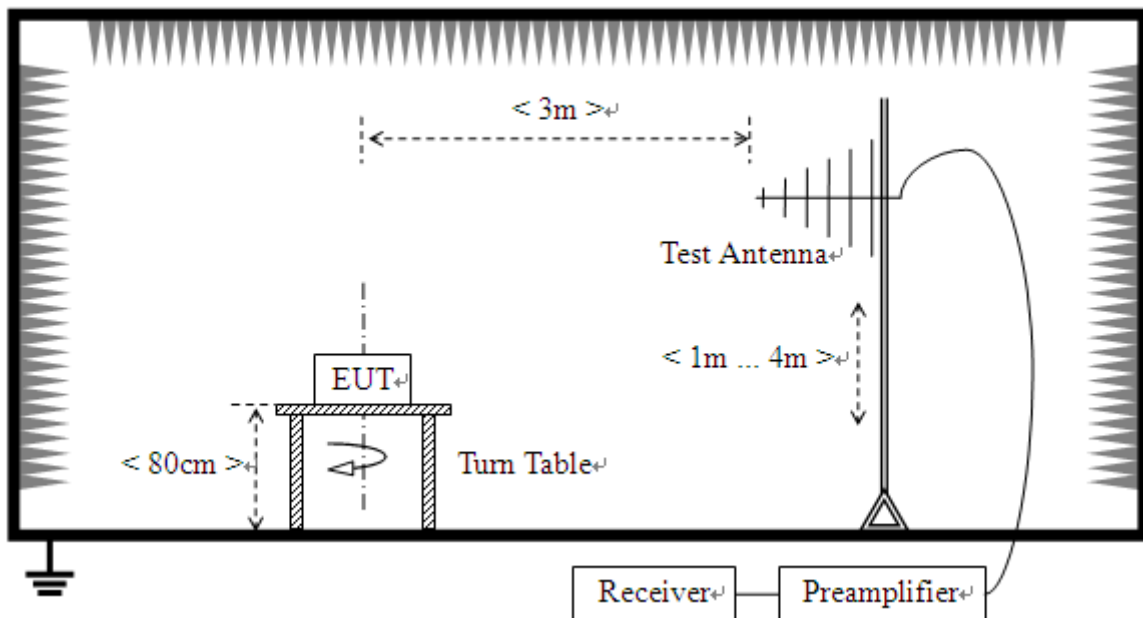


### 2.6.3. Test Setup

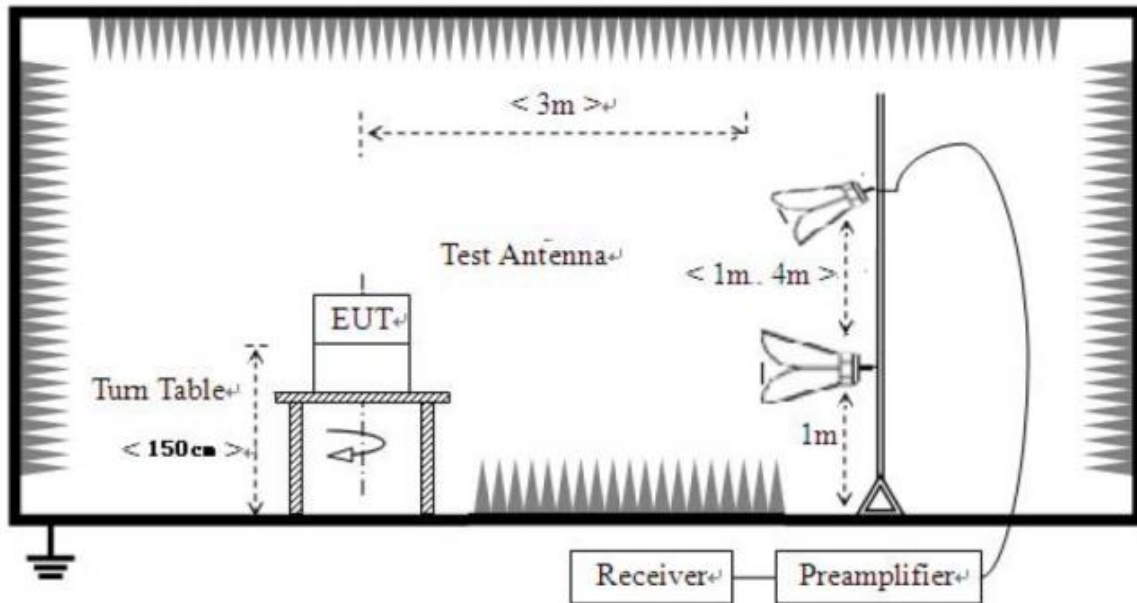
For radiated emissions from 9 kHz to 30 MHz



For radiated emissions from 30MHz to 1GHz



### For radiated emissions above 1GHz



#### 2.6.4. Test Procedures

1. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
6. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for

Quasi-peak detection (QP) at frequency below 1 GHz.

2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ( $10 \log(1/\text{duty cycle})$ ).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
5. Only worst-Case mode data provide here, 802.11n (20MHz) 5745MHz for Below 1GHz.

#### **2.6.5. Test Result of Radiated Band Edge and Spurious Emission**

For 9 kHz to 30MHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1GHz, All of the EUT Configure mode were tested and found 802.11n20\_5745MHz channel is the worst mode, the worst case is recorded in this report.

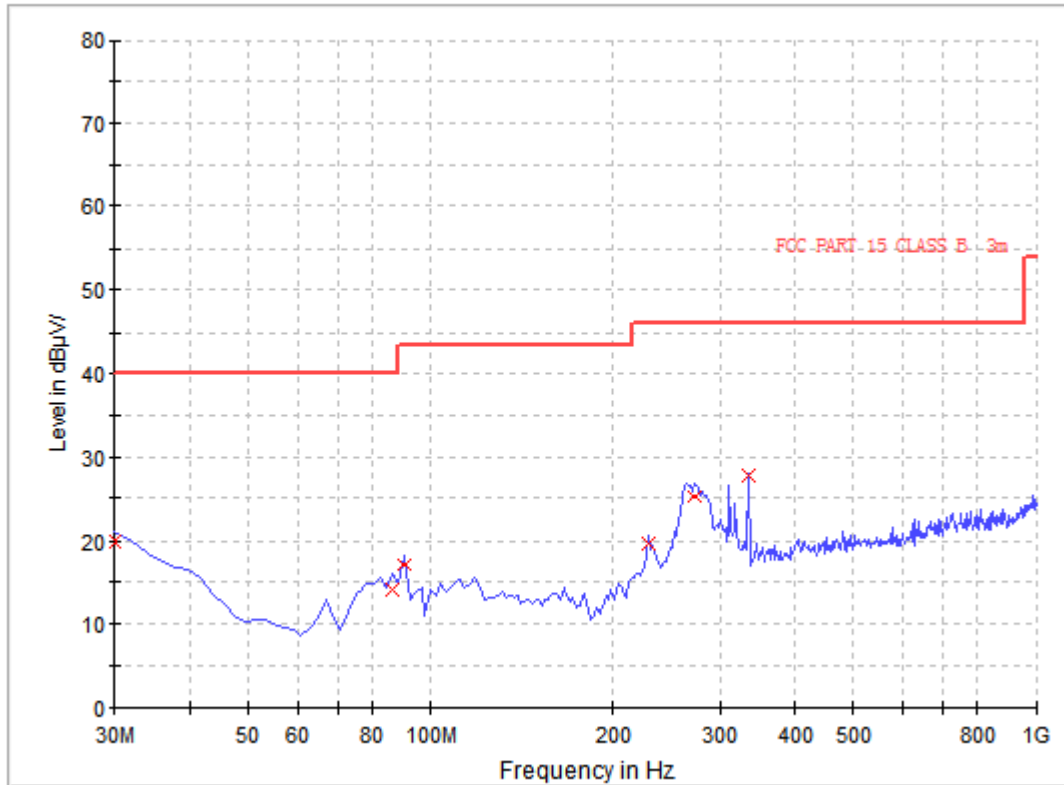
For 1GHz to 18GHz, Only worst-case data is reported.

For above 18GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

### For 30MHz to 1000 MHz

Test site:	3M anechoic chamber	Environment:	Temp: 23℃; Humi:48%;101kPa
Operator:	Huang Chaoming	Test Date:	2024.07.29
Test Mode:	5G WIFI - TX	Test Result:	Pass

EMI Sweep-3M(30-1G)



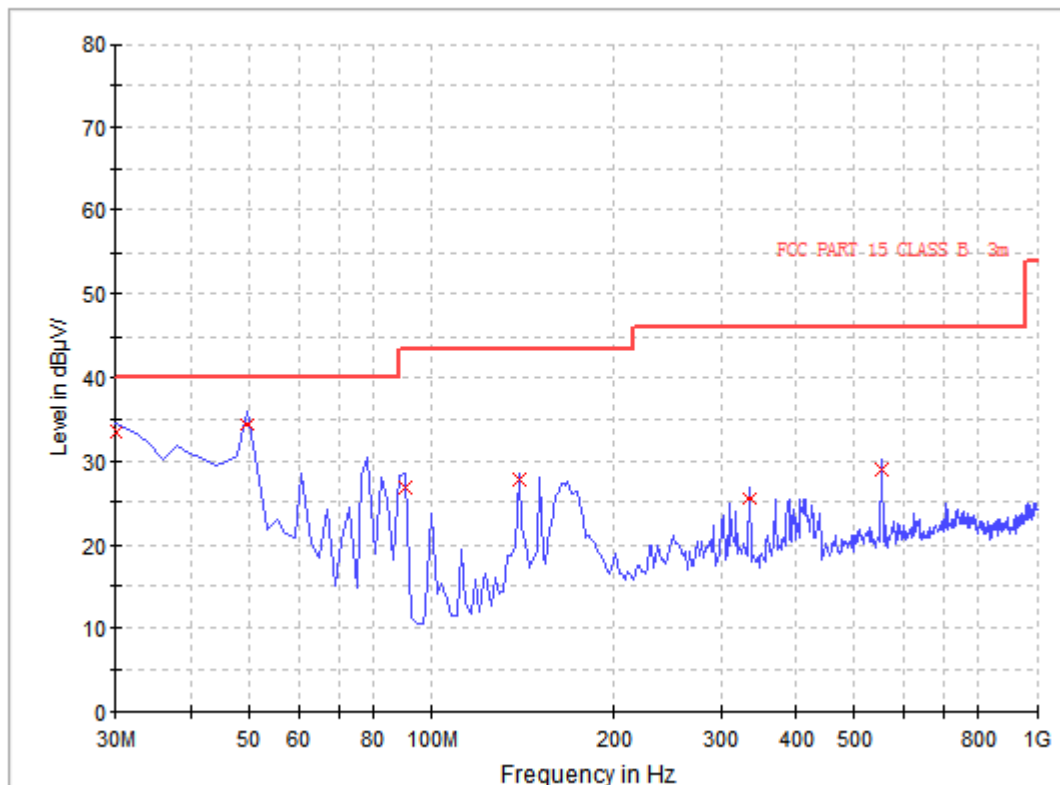
Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Bandwidth (kHz)	Height (cm)	Polarity	Corr. (dB/m)	Margin - QPK	Limit - QPK
30.000000	19.95	120.000	100.0	H	21.1	20.05	40.0
86.360000	14.00	120.000	100.0	H	10.7	26.00	40.0
90.280000	17.11	120.000	100.0	H	11.3	26.39	43.5
228.280000	19.70	120.000	100.0	H	12.6	26.30	46.0
273.000000	25.34	120.000	100.0	H	15.1	20.66	46.0
335.200000	27.90	120.000	100.0	H	17.1	18.10	46.0

#### Remark:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB).
- Margin value = Limit value - Emission Level.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Only the antenna height (from 1m to 4m) at maximum reading are recorded.

Test site:	3M anechoic chamber	Environment:	Temp: 23°C; Humi:48%;101kPa
Operator:	Huang Chaoming	Test Date:	2024.07.29
Test Mode:	5G WIFI - TX	Test Result:	Pass

EMI Sweep-3M(30-1G)



Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Bandwidth (kHz)	Height (cm)	Polarity	Corr. (dB/m)	Margin - QPK	Limit - QPK
30.000000	33.49	120.000	100.0	V	21.1	6.51	40.0
49.440000	34.43	120.000	100.0	V	10.5	5.57	40.0
90.280000	26.83	120.000	100.0	V	11.3	16.67	43.5
138.840000	27.78	120.000	100.0	V	13.8	15.72	43.5
335.200000	25.42	120.000	100.0	V	17.1	20.58	46.0
552.920000	29.12	120.000	100.0	V	20.3	16.88	46.0

#### Remark:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB).
- Margin value = Limit value - Emission Level.
- The emission levels of other frequencies are very lower than the limit and not show in test report.
- Only the antenna height (from 1m to 4m) at maximum reading are recorded.

**For 1GHz to 40 GHz**

U-NII-3_802.11n20_5745MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
5650.00	50.16	68.20	-18.04	1.50	240	49.36	0.80	Horizontal	Peak
5700.00	51.18	105.20	-54.02	1.50	240	49.94	1.24	Horizontal	Peak
5720.00	50.79	110.80	-60.01	1.50	240	49.51	1.28	Horizontal	Peak
5725.00	51.07	122.20	-71.13	1.50	240	49.77	1.30	Horizontal	Peak
11490.00	55.02	68.20	-13.18	1.50	240	43.47	11.55	Horizontal	Peak
11490.00	43.38	54.00	-10.62	1.50	240	31.83	11.55	Horizontal	Average
5650.00	50.18	68.20	-18.02	1.70	160	49.38	0.80	Vertical	Peak
5700.00	51.61	105.20	-53.59	1.70	160	50.37	1.24	Vertical	Peak
5720.00	52.27	110.80	-58.53	1.70	160	50.99	1.28	Vertical	Peak
5725.00	51.92	122.20	-70.28	1.70	160	50.62	1.30	Vertical	Peak
11490.00	55.22	68.20	-12.98	1.70	160	43.67	11.55	Vertical	Peak
11490.00	43.30	54.00	-10.70	1.70	160	31.75	11.55	Vertical	Average
U-NII-3_802.11n20_5825MHz									
Frequency (MHz)	Emssion Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)	Polarity	Detector
5850.00	51.85	122.20	-70.35	1.50	240	50.03	1.82	Horizontal	Peak
5855.00	51.44	110.80	-59.36	1.50	240	49.59	1.85	Horizontal	Peak
5875.00	52.11	105.20	-53.09	1.50	240	50.13	1.98	Horizontal	Peak
5925.00	51.59	68.20	-16.61	1.50	240	49.47	2.12	Horizontal	Peak
11650.00	54.57	68.20	-13.63	1.50	240	42.93	11.64	Horizontal	Peak
11650.00	43.07	54.00	-10.93	1.50	240	31.43	11.64	Horizontal	Average
5850.00	51.74	122.20	-70.46	1.70	160	49.92	1.82	Vertical	Peak
5855.00	51.41	110.80	-59.39	1.70	160	49.56	1.85	Vertical	Peak
5875.00	51.60	105.20	-53.60	1.70	160	49.62	1.98	Vertical	Peak
5925.00	52.45	68.20	-15.75	1.70	160	50.33	2.12	Vertical	Peak
11650.00	55.54	68.20	-12.66	1.70	160	43.90	11.64	Vertical	Peak
11650.00	42.80	54.00	-11.20	1.70	160	31.16	11.64	Vertical	Average
<b>Remark:</b> 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m) 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB) 3. Margin value = Emission Level – Limit value 4. The emission levels of other frequencies are very lower than the limit and not show in test report.									

## 2.7. AC Power Line Conducted Emission

### 2.7.1. Limit of AC Power Line Conducted Emission

FCC Part 15.207:

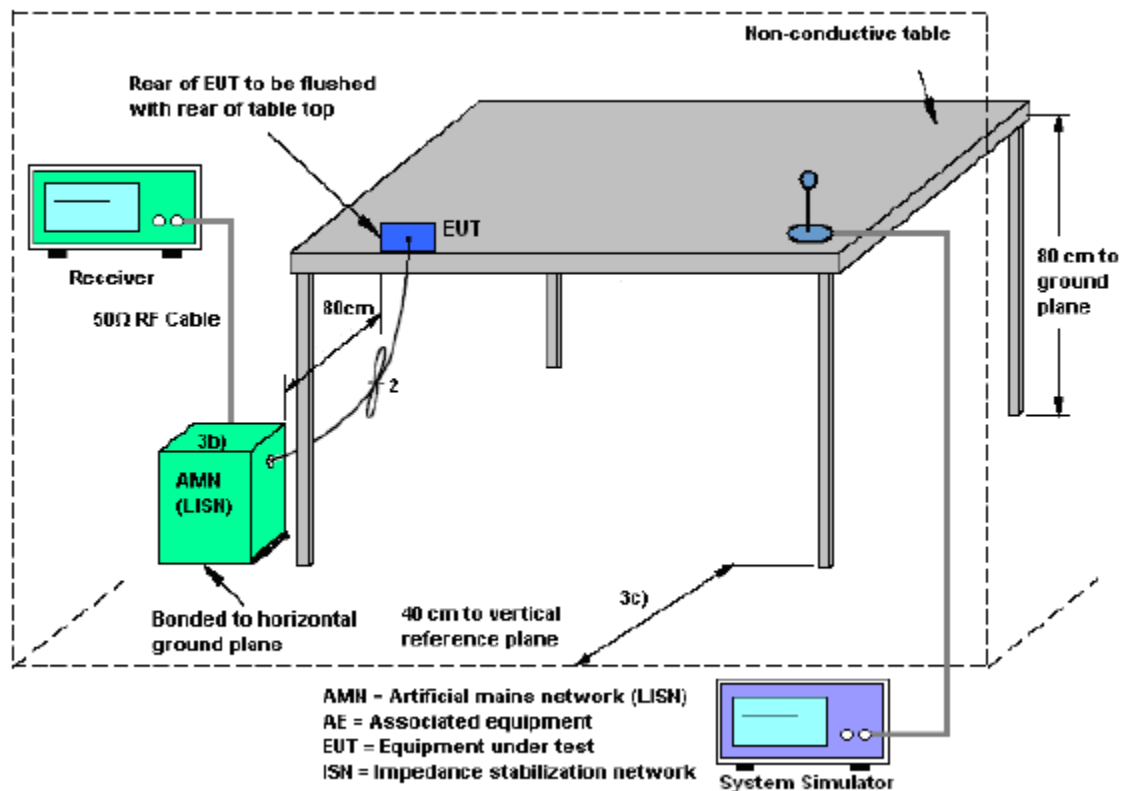
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

### 2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.7.3. Test Setup



#### **2.7.4. Test Procedures**

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

#### **2.7.5. Test Result of AC Power Line Conducted Emission**

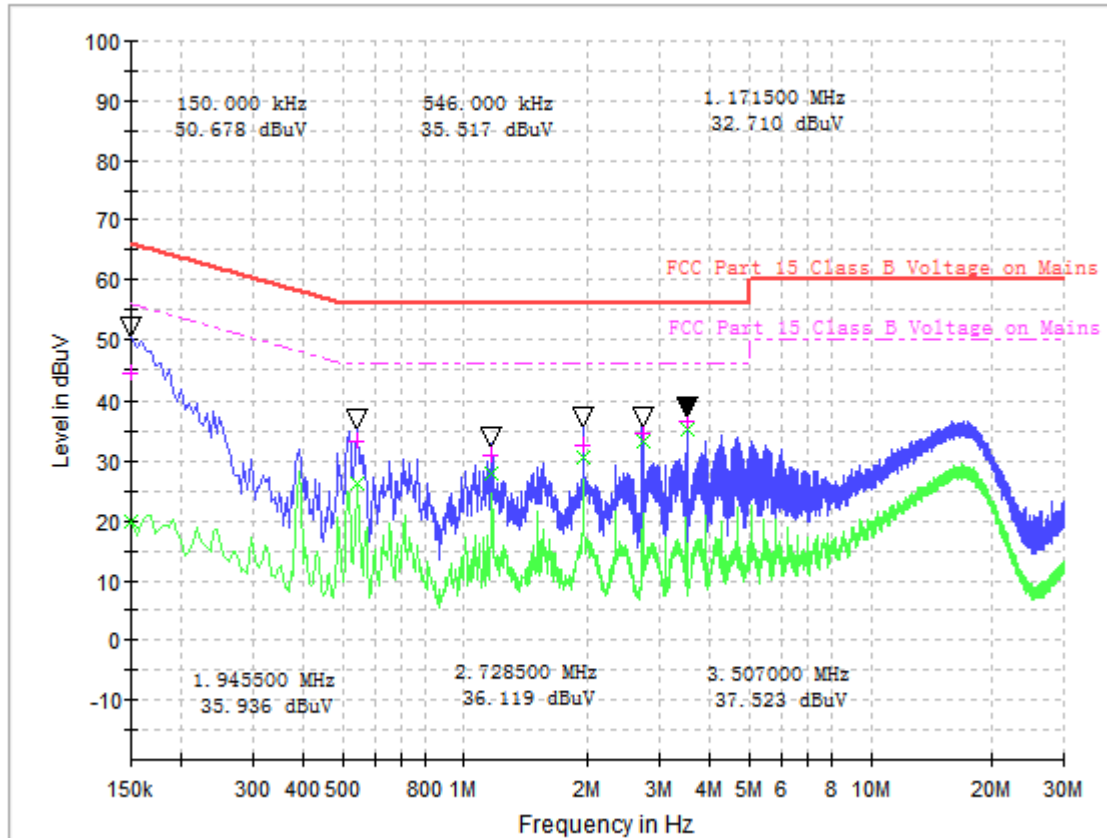
The EUT configuration of the emission tests is 5G WLAN Link + Wireless charging(Charging adapter through USB cable connection).

All of the EUT Configure mode were tested and found 802.11n20\_5745MHz channel is the worst mode, the worst case is recorded in this report.



## Project Information

Test site:	Shield ROOM 2	Environment:	Temp: 23°C; Humi:53%;101kPa
Operator:	LI QINGLONG	Test Date:	2024.07.29
Test Mode:	5G WIFI - TX	Test Part:	L



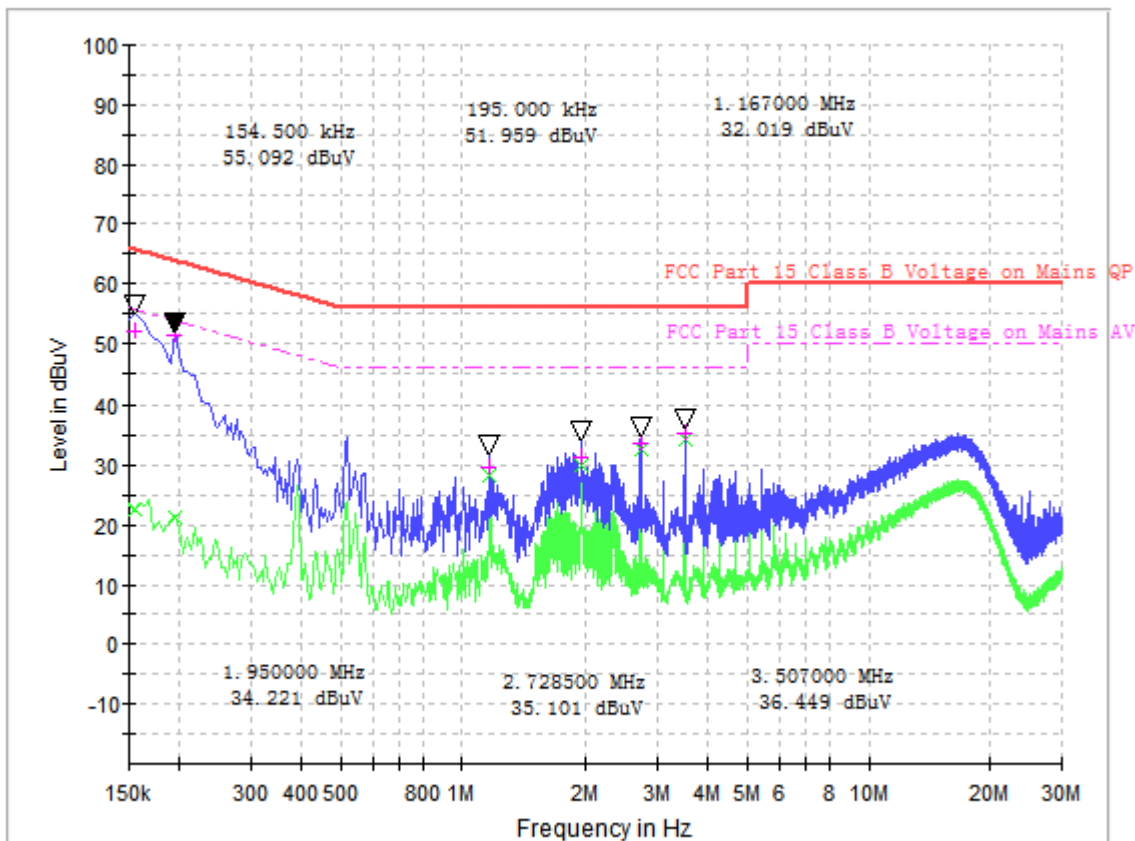
Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Corr.Factor (dB)	Margin - QPK	Limit - QPK (dBμV)	Margin - AV (dB)	Limit - AV (dBμV)
0.150000	44.30	19.84	10.8	21.70	66.0	36.16	56.0
0.546000	33.28	26.25	10.7	22.72	56.0	19.75	46.0
1.171500	31.02	28.10	10.7	24.98	56.0	17.90	46.0
1.945500	32.50	30.51	10.7	23.50	56.0	15.49	46.0
2.728500	34.74	33.41	10.6	21.26	56.0	12.59	46.0
3.507000	36.56	35.19	10.5	19.44	56.0	10.81	46.0

**Test Result : Pass**

Note: Final Level = Receiver Read level + Correction factor.

## Project Information

Test site:	Shield ROOM 2	Environment:	Temp: 23°C; Humi:53%;101kPa
Operator:	LI QINGLONG	Test Date:	2024.07.29
Test Mode:	5G WIFI - TX	Test Part:	N



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Corr.Factor (dB)	Margin - QPK	Limit - QPK (dBμV)	Margin - AV (dB)	Limit - AV (dBμV)
0.154500	52.06	22.70	10.9	13.69	65.8	33.05	55.8
0.195000	51.38	21.37	10.9	12.44	63.8	32.45	53.8
1.167000	29.48	28.28	10.8	26.52	56.0	17.72	46.0
1.950000	31.43	29.97	10.8	24.57	56.0	16.03	46.0
2.728500	33.66	32.49	10.7	22.34	56.0	13.51	46.0
3.507000	35.44	34.25	10.6	20.56	56.0	11.75	46.0

**Test Result : Pass**

Note: Final Level = Receiver Read level + Correction factor.

### 3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	5M Anechoic Chamber	Albatross	SAC-5MAC 12.8x6.8x6.4m	A0304210	2022.06.09	2025.06.08
2	EMI Test Receiver	ROHDE&SCHWARZ	ESW26	A180502935	2024.05.23	2025.05.22
3	Loop Antenna	Schwarz beck	HFH2-Z2	A0304220	2022.05.02	2025.05.01
4	Broadband antenna (30MHz~1GHz)	R&S	HL562	A0304224	2023.06.08	2026.06.07
5	EMI Horn Ant. (1-18G)	ETC	MCTD-1209	A150402241	2023.05.16	2026.05.15
6	Horn antenna (18GHz~26.5GHz)	AR	AT4510	A0804450	2023.06.01	2026.05.31
7	Amplifier 30M~1GHz	MILMEGA	80RF1000-10004	A140101634	2023.10.20	2024.10.19
8	Amplifier 1G~18GHz	MILMEGA	AS0104R-800/400	A160302517	2023.10.20	2024.10.19
9	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2024.01.18	2025.01.17
10	Test Receiver	R&S	ESIB7	A0501375	2024.02.28	2025.02.27
11	Broadband Ant.	ETC	MCTD 2786	A150402240	2023.05.22	2026.05.21
12	3M Anechoic Chamber	Albatross	SAC-3MAC 9*6*6m	A0412375	2024.02.27	2027.02.26
13	Temperature chamber	ESPEC	SU-642	A150802409	2024.02.22	2025.02.21
14	Test Receiver	KEYSIGHT	N9038A	A141202036	2024.06.05	2025.06.04
15	LISN	ROHDE&SCHWARZ	ENV216	A140701847	2024.05.23	2025.05.22

#### 4. Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2020. All the measurement uncertainty value were shown with a coverage  $K=2$  to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

##### Uncertainty of AC Power Line Conducted Emission Measurement (150kHz~30MHz)

Measuring Uncertainty for a level of confidence of 95% ( $U=2U_c(y)$ )	2.8dB
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##### Uncertainty of Radiated Emission Measurement (9kHz~30MHz)

Measuring Uncertainty for a level of confidence of 95% ( $U=2U_c(y)$ )	3.5dB
--	-------

##### Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

Measuring Uncertainty for a level of confidence of 95% ( $U=2U_c(y)$ )	3.91dB
--	--------

##### Uncertainty of Radiated Emission Measurement (1GHz~18GHz)

Measuring Uncertainty for a level of confidence of 95% ( $U=2U_c(y)$ )	4.5dB
--	-------

##### Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

Measuring Uncertainty for a level of confidence of 95% ( $U=2U_c(y)$ )	4.9dB
--	-------

##### Uncertainty of RF Conducted Measurement (9kHz~40GHz)

Measuring Uncertainty for a level of confidence of 95% ( $U=2U_c(y)$ )	1.2dB
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##### Uncertainty of Occupied Bandwidth Measurement

Measuring Uncertainty for a level of confidence of 95% ( $U=2U_c(y)$ )	1.2%
--	------



## Appendix A

### Duty Cycle

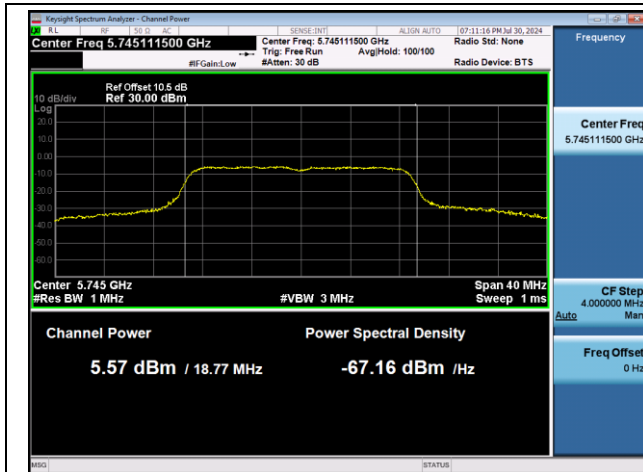
#### Test Result and Data

U-NII-3:						
Test Mode	Antenna	Frequency[MHz]	ON Time[ms]	Period[ms]	Duty Cycle[%]	DC Factor
11N20SISO	Ant1	5745	0.16	0.20	80.00	0.97

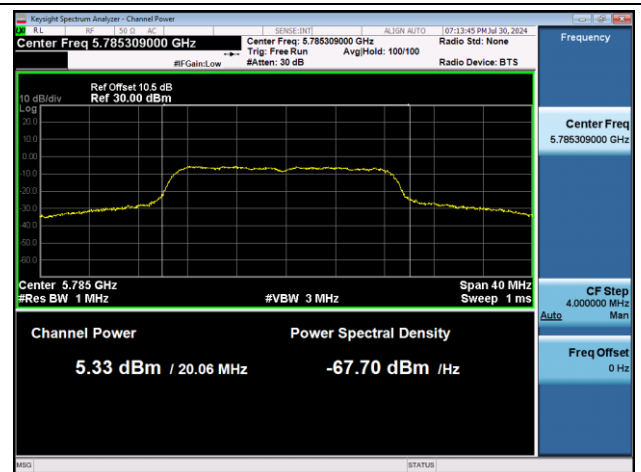
**Output power  
Test Result and Data****U-NII-3:**

Test Mode	Antenna	Frequency [MHz]	Power [dBm]	DC Factor [dBm]	Result [dBm]	Power Limit [dBm]	Verdict
11N20SISO	Ant1	5745	5.57	0.97	6.54	≤30.00	PASS
11N20SISO	Ant1	5785	5.33	0.97	6.30	≤30.00	PASS
11N20SISO	Ant1	5825	4.79	0.97	5.76	≤30.00	PASS

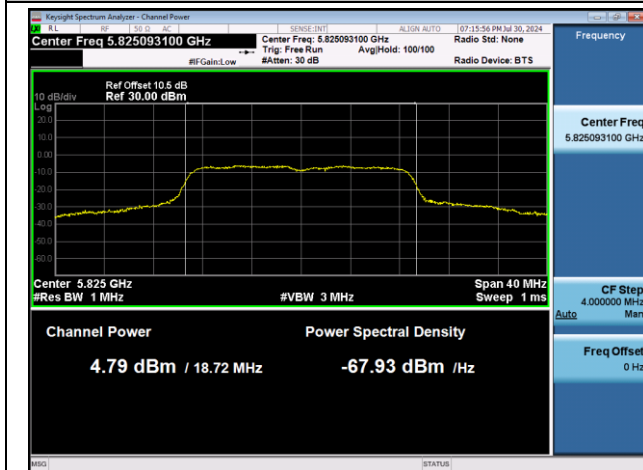
## Test Graphs



11N20SISO-Ant1-5745-PASS



11N20SISO-Ant1-5785-PASS



11N20SISO-Ant1-5825-PASS

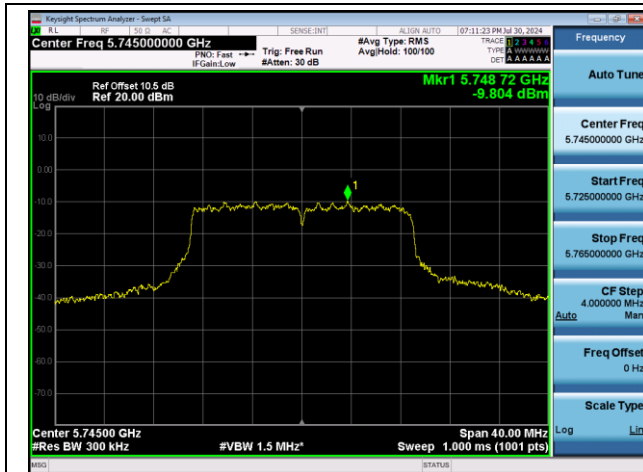
**AVGSA Power Spectral Density  
Test Result and Data****U-NII-3:**

Test Mode	Antenna	Frequency[MHz]	Result[dBm/500kHz]	Limit[dBm/500kHz]	Verdict
11N20SISO	Ant1	5745	-6.61	≤30.00	PASS
11N20SISO	Ant1	5785	-7.12	≤30.00	PASS
11N20SISO	Ant1	5825	-6.94	≤30.00	PASS

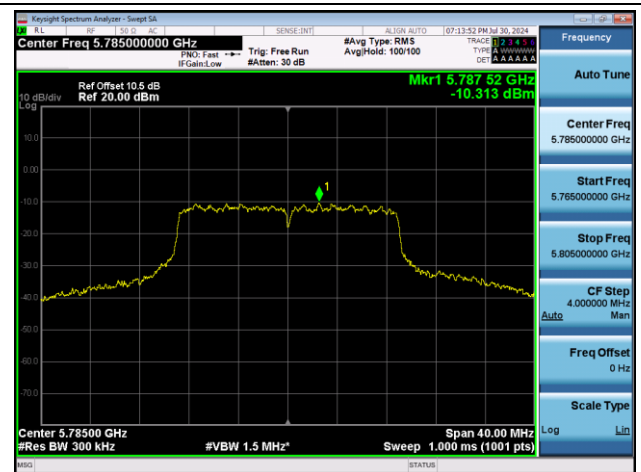
Note: The Duty Cycle Factor and RBW Factor is compensated in the graph.



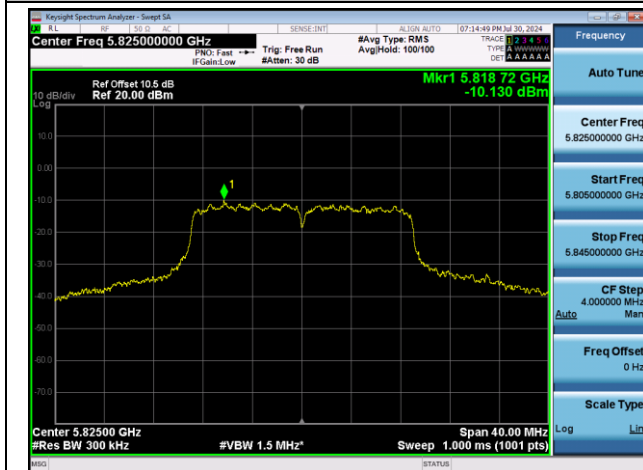
## Test Graphs



11N20SISO-Ant1-5745-PASS



11N20SISO-Ant1-5785-PASS

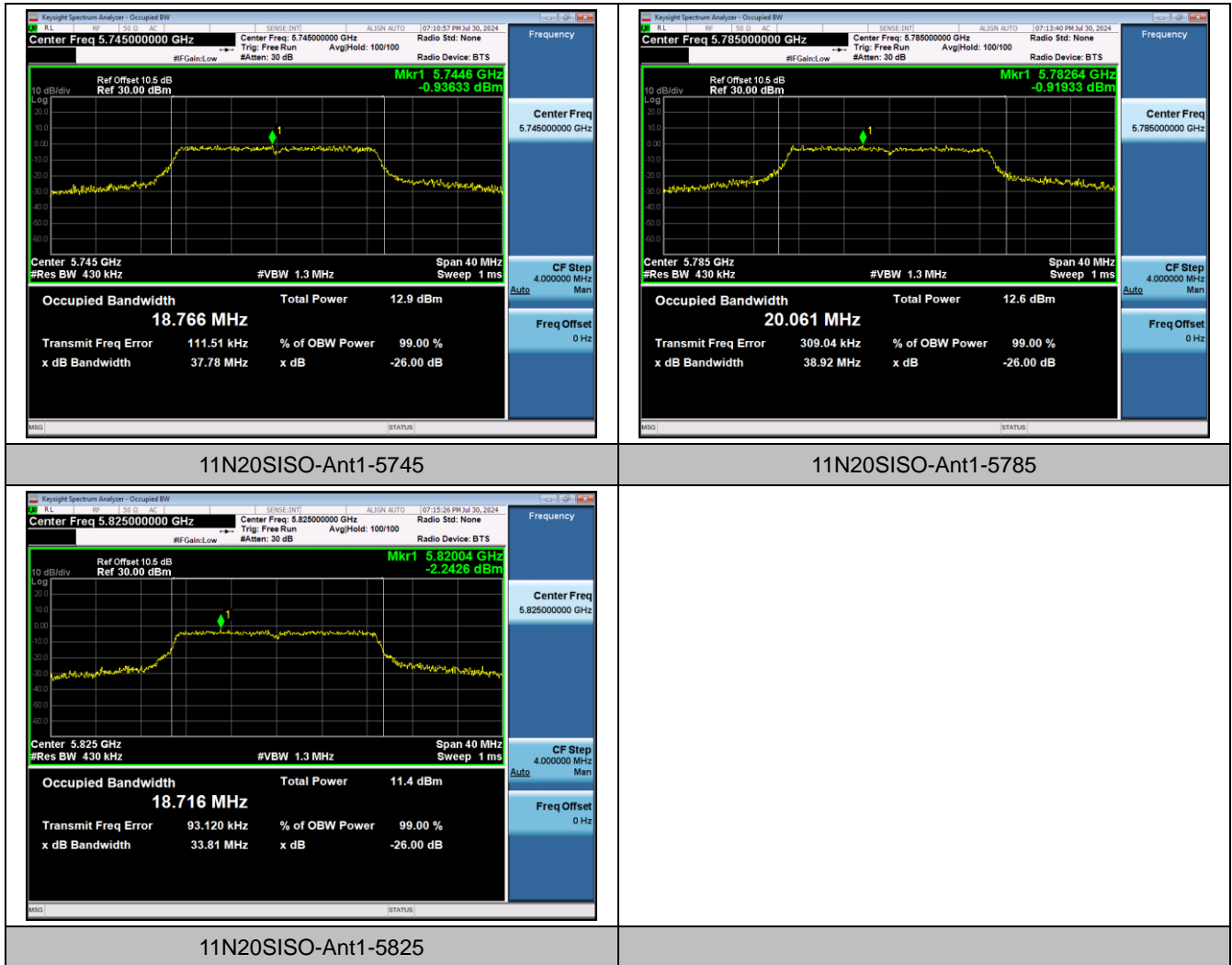


11N20SISO-Ant1-5825-PASS

**99% Occupied Bandwidth****Test Result and Data****U-NII-3:**

Test Mode	Antenna	Frequency [MHz]	99% OBW [MHz]	Verdict
11N20SISO	Ant1	5745	18.766	PASS
11N20SISO	Ant1	5785	20.061	PASS
11N20SISO	Ant1	5825	18.716	PASS

## Test Graphs



11N20SISO-Ant1-5745

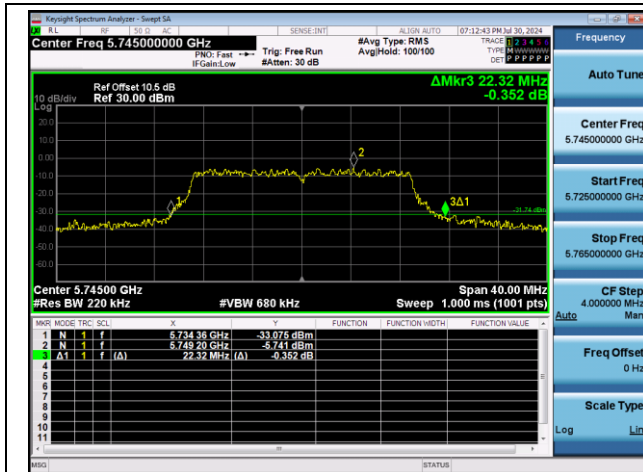
11N20SISO-Ant1-5785

11N20SISO-Ant1-5825

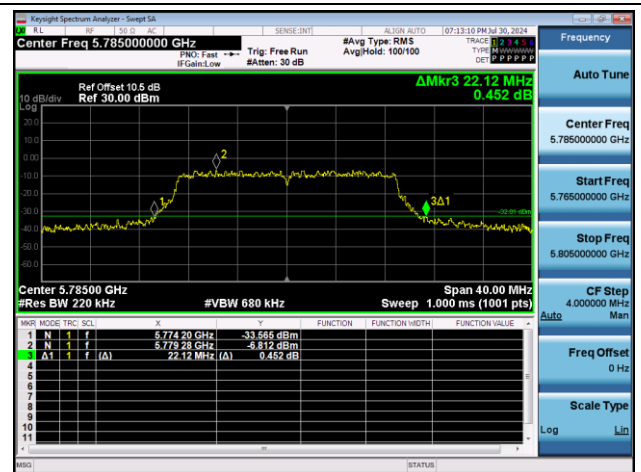
**26dB Emission Bandwidth****Test Result and Data****U-NII-3:**

Test Mode	Antenna	Frequency [MHz]	26dB EBW[MHz]	Verdict
11N20SISO	Ant1	5745	22.320	PASS
11N20SISO	Ant1	5785	22.120	PASS
11N20SISO	Ant1	5825	21.800	PASS

## Test Graphs



11N20SISO-Ant1-5745



11N20SISO-Ant1-5785



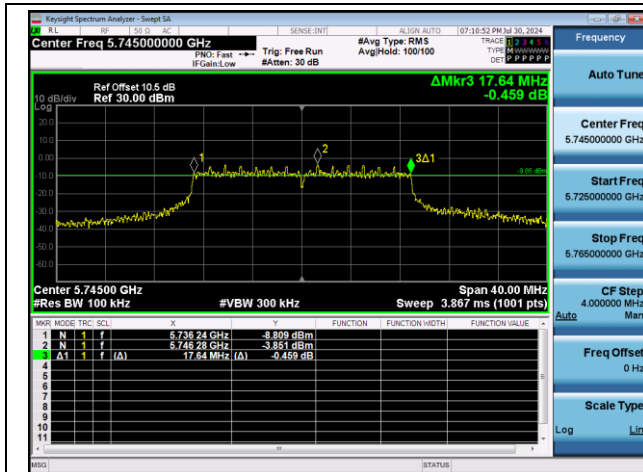
11N20SISO-Ant1-5825

**6dB Down Bandwidth  
Test Result and Data**

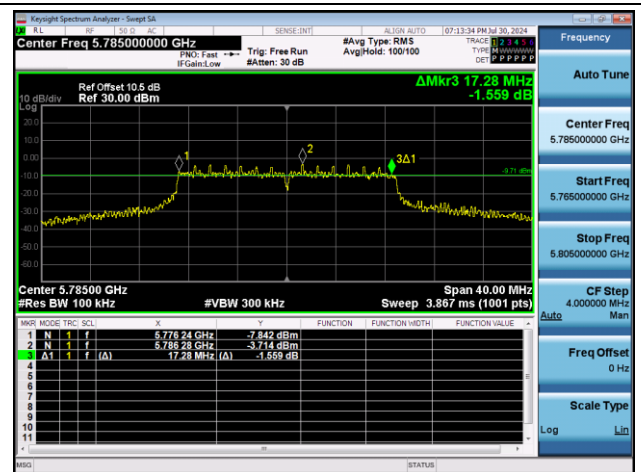
U-NII-3:					
Test Mode	Antenna	Frequency[MHz]	6dB EBW[MHz]	Limit[MHz]	Verdict
11N20SISO	Ant1	5745	17.640	0.5	PASS
11N20SISO	Ant1	5785	17.280	0.5	PASS
11N20SISO	Ant1	5825	17.640	0.5	PASS



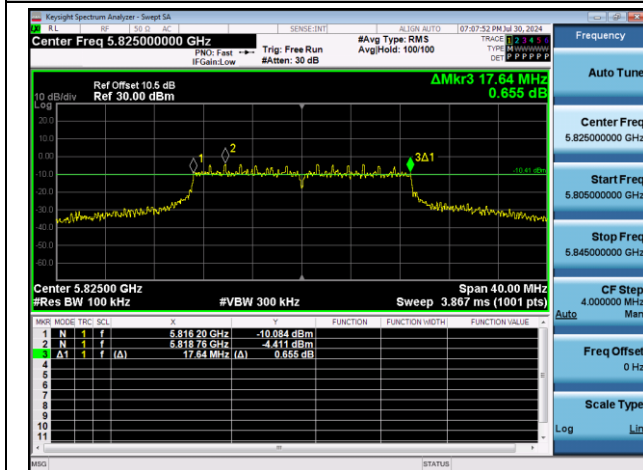
## Test Graphs



11N20SISO-Ant1-5745-PASS



11N20SISO-Ant1-5785-PASS



11N20SISO-Ant1-5825-PASS





## Frequency Stability Test Result and Data

### U-NII-3:

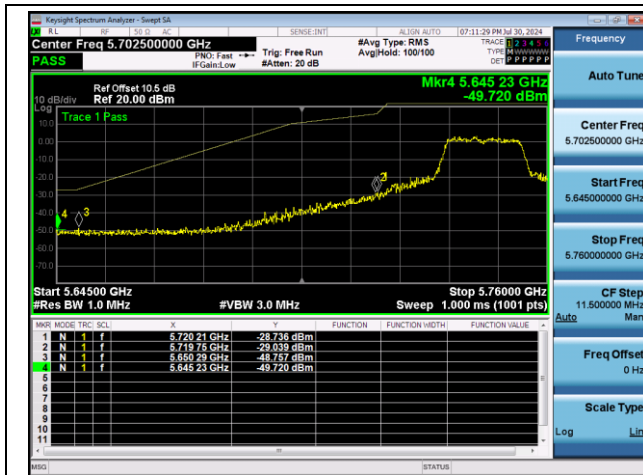
Test Mode	Antenna	Frequency[ MHz]	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11N20SISO	Ant1	5745	NV	NT	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	LV	NT	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	HV	NT	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	-30	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	-20	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	-10	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	0	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	10	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	20	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	30	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	40	-20000.00	-3.481288	20	PASS
11N20SISO	Ant1	5745	NV	50	-20000.00	-3.481288	20	PASS



**Conducted Band Edges****Test Result and Data**

Test Mode	Antenna	ChName	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
11N20SISO	Ant1	Low	5745	-28.74	≤16.08	PASS
11N20SISO	Ant1	Low	5745	-29.04	≤15.53	PASS
11N20SISO	Ant1	Low	5745	-48.76	≤-26.79	PASS
11N20SISO	Ant1	Low	5745	-49.72	≤-27	PASS
11N20SISO	Ant1	High	5825	-33.59	≤16.03	PASS
11N20SISO	Ant1	High	5825	-31.64	≤15.50	PASS
11N20SISO	Ant1	High	5825	-48.87	≤-25.51	PASS
11N20SISO	Ant1	High	5825	-49.18	≤-27	PASS

## Test Graphs

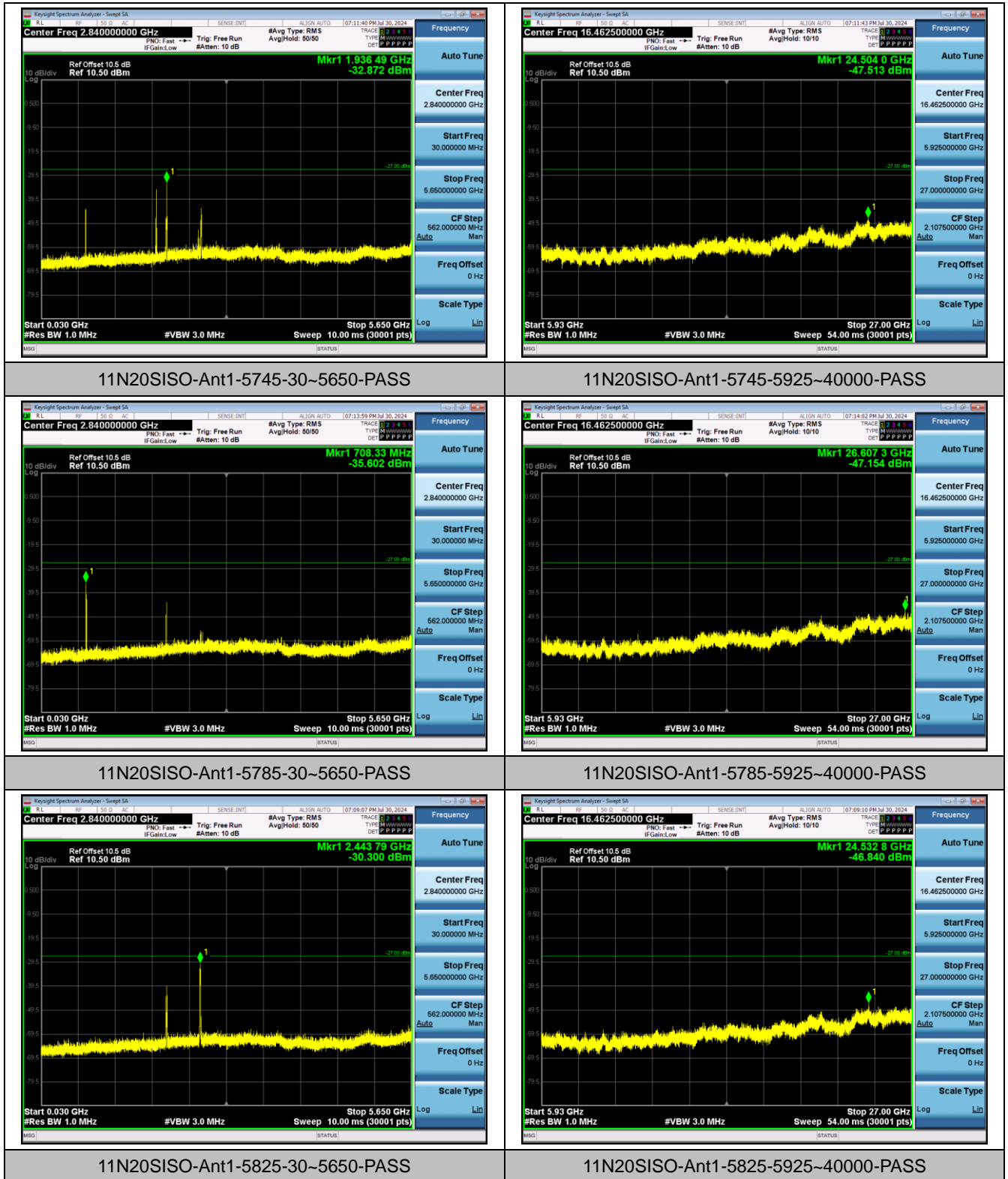


11N20SISO-Ant1-5745-PASS



11N20SISO-Ant1-5825-PASS

# Conducted Spurious Emissions Test Result and Data



\*\* END OF REPORT \*\*