

TEST REPORT

Applicant: Quectel Wireless Solutions Co., Ltd.
EUT Description: LTE Module with Wi-Fi & Bluetooth
Model: SC200V-NA
Brand: QUECTEL
FCC ID: XMR2025SC200VNA
Standards: FCC 47 CFR Part 15 Subpart E
Date of Receipt: 2025/01/13
Date of Test: 2025/01/13 to 2025/03/05
Date of Issue: 2025/04/22

TOWE. Tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. Without written approval of TOWE, the test report shall not be reproduced except in full.



A handwritten signature in black ink, appearing to be "Huang Kun".

Huang Kun
Approved By:

A handwritten signature in black ink, appearing to be "Chen Chengfu".

Chen Chengfu
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2025/03/06	Original	Chen Chengfu
02	2025/04/22	Updated the model and serial number of the development board	Chen Chengfu

Summary of Test Results

Clause	FCC Part	Test Items	Test Bands	Result
4.1	§15.203	Antenna Requirement	---	PASS
4.2	§15.407(g)	Frequency Stability	---	---
4.3	§15.207	AC Power Line Conducted Emission	Section 2.2	N/A
4.4	§15.407(a)(1)(iv) §15.407(a)(2) §15.407(a)(3)(i)	Maximum Conducted Output Power	U-NII-1 U-NII-2A U-NII-2C U-NII-3	PASS
4.5	§KDB 789033 II.C.1	Emission Bandwidth	U-NII-1 U-NII-2A U-NII-2C	Reporting purposes only
4.6	§15.407(e)	Minimum Emission Bandwidth	U-NII-3	PASS
4.7	§KDB 789033 II.D	Occupied Bandwidth	U-NII-1 U-NII-2A U-NII-2C U-NII-3	Reporting purposes only
4.8	§15.407(a)(1)(iv) §15.407(a)(2) §15.407(a)(3)(i)	Maximum Power Spectral Density	U-NII-1 U-NII-2A U-NII-2C U-NII-3	PASS
4.9	§15.407(b) §15.209(d)	Unwanted Emissions	U-NII-1 U-NII-2A U-NII-2C U-NII-3	PASS

Test Method: ANSI C63.10:2020, KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Remark:

1. Pass is EUT meets standard requirements.
2. The EUT is DC power supply, "N/A" denotes "not applicable".

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1 General Description

1.1 Lab Information

1.1.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. Facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014
Tel.: +86-755-27212361
Contact Email: info@towewireless.com

1.1.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. Has been recognized as an accredited testing laboratory. Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. Has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0152

Company Number: 31000

1.2 Client Information

1.2.1 Applicant

Applicant:	Quectel Wireless Solutions Co., Ltd.
Address:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, 200233, China.

1.2.2 Manufacturer

Manufacturer:	Quectel Wireless Solutions Co., Ltd.
Address:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, 200233, China.

1.3 Product Information

EUT Description:	LTE Module with Wi-Fi & Bluetooth			
Model No.:	SC200V-NA			
Brand:	QUECTEL			
Hardware Version:	R1.0			
Software Version:	SC200VNANAR01A01			
IMEI:	RF Conducted	868757070001561		
	RSE	868757070002221		
Modulation Type:	802.11a&n:	OFDM-BPSK, QPSK, 16QAM, 64QAM		
	802.11ac:	OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM		
Smart System:	☒ SISO:	802.11a/n/ac	/	
	☐ MIMO:	802.11n/ac	()TX()RX	
	☐ CDD:	802.11a	()TX()RX	
EUT Function	☒ Client	☐ Outdoor AP	☐ Indoor AP ☐ Fixed P2P AP	
DFS Function:	☐ Master ☐ Slave with radar detection ☒ Slave without radar detection			
Frequency Range:	U-NII-1:	5150 ~ 5250MHz		
	U-NII-2A:	5250 ~ 5350MHz		
	U-NII-2C:	5470 ~ 5725MHz		
	U-NII-3:	5725 ~ 5850MHz		
Channel Frequency:	20M BWch.:	U-NII-1:	5180 ~ 5240MHz	4 Channels
		U-NII-2A:	5260 ~ 5320MHz	4 Channels
		U-NII-2C:	5500 ~ 5700MHz	11 Channels
		U-NII-3:	5745 ~ 5825MHz	5 Channels
		Straddle Channel:	5720MHz	1 Channel
	40M BWch.:	U-NII-1:	5190 ~ 5230MHz	2 Channels
		U-NII-2A:	5270 ~ 5310MHz	2 Channels
		U-NII-2C:	5510 ~ 5670MHz	5 Channels
		U-NII-3:	5755 ~ 5795MHz	2 Channels
		Straddle Channel:	5710MHz	1 Channel
	80M BWch.:	U-NII-1:	5210MHz	1 Channel
		U-NII-2A:	5290MHz	1 Channel
		U-NII-2C:	5530 ~ 5610MHz	2 Channels
		U-NII-3:	5775MHz	1 Channel
		Straddle Channel:	5690MHz	1 Channel
Antenna Type:	☒ External, ☐ Integrated			
Antenna Gain:	Frequency Range	Ant0 (dBi)		
	U-NII-1:	-0.67		
	U-NII-2A:	-0.19		
	U-NII-2C:	1.28		
	U-NII-3:	1.1		

Remark: The above EUT's information was declared by applicant, please refer to the specifications or user's manual for more detailed description.

2 Test Configuration

2.1 Test Channel

Frequency Channels for U-NII-1							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz
38	5190MHz	42	5210MHz	46	5230MHz	/	
Remark:							
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:							
Modulation Type		Test Channel		Test Frequency			
802.11a/n20 /ac20		The Lowest channel (CH36)		5180MHz			
		The Middle channel (CH40)		5200MHz			
		The Highest channel (CH48)		5240MHz			
Modulation Type		Test Channel		Test Frequency			
802.11n40 /ac40		The Lowest channel (CH38)		5190MHz			
		The Highest channel (CH46)		5230MHz			
Modulation Type		Test Channel		Test Frequency			
802.11ac80		The Middle channel (CH42)		5210MHz			

Frequency Channels for U-NII-2A							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
52	5260MHz	56	5280MHz	60	5300MHz	64	5320MHz
54	5270MHz	58	5290MHz	62	5310MHz	/	
Remark:							
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:							
Modulation Type		Test Channel		Test Frequency			
802.11a/n20 /ac20		The Lowest channel (CH52)		5260MHz			
		The Middle channel (CH60)		5300MHz			
		The Highest channel (CH64)		5320MHz			
Modulation Type		Test Channel		Test Frequency			
802.11n40 /ac40		The Lowest channel (CH54)		5270MHz			
		The Highest channel (CH62)		5310MHz			
Modulation Type		Test Channel		Test Frequency			
802.11ac80		The Middle channel (CH58)		5290MHz			

Frequency Channels for U-NII-2C

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
100	5500MHz	110	5550MHz	120	5600MHz	132	5660MHz
102	5510MHz	112	5560MHz	122	5610MHz	134	5670MHz
104	5520MHz	114	5570MHz	124	5620MHz	136	5680MHz
106	5530MHz	116	5580MHz	126	5630MHz	140	5700MHz
108	5540MHz	118	5590MHz	128	5640MHz	/	

Remark:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Modulation Type	Test Channel	Test Frequency
802.11a/n20 /ac20	The Lowest channel (CH100)	5500MHz
	The Middle channel (CH116)	5580MHz
	The Highest channel (CH140)	5700MHz
Modulation Type	Test Channel	Test Frequency
802.11n40 /ac40	The Lowest channel (CH102)	5510MHz
	The Middle channel (CH118)	5590MHz
	The Highest channel (CH134)	5670MHz
Modulation Type	Test Channel	Test Frequency
802.11ac80	The Lowest channel (CH106)	5530MHz
	The Highest channel (CH122)	5610MHz

Frequency Channels for U-NII-3

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

Remark:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Modulation Type	Test Channel	Test Frequency
802.11a/n20 /ac20	The Lowest channel (CH149)	5745MHz
	The Middle channel (CH157)	5785MHz
	The Highest channel (CH165)	5825MHz
Modulation Type	Test Channel	Test Frequency
802.11n40 /ac40	The Lowest channel (CH151)	5755MHz
	The Highest channel (CH159)	5795MHz
Modulation Type	Test Channel	Test Frequency
802.11ac80	The Middle channel (CH155)	5775MHz

Straddle Channel		
Modulation Type	Test Channel	Test Frequency
802.11a/n20 /ac20	The channel (CH144)	5720MHz
Modulation Type	Test Channel	Test Frequency
802.11n40/ac40	The channel (CH142)	5710MHz
Modulation Type	Test Channel	Test Frequency
802.11ac80	The channel (CH138)	5690MHz

2.2 Worst-case configuration and Mode

Modulation Type	SISO - Data Rate	MIMO - Data Rate
802.11a	6 Mbps	NA
802.11n20	MCS0 (6.5 Mbps)	NA
802.11n40	MCS0 (13.5 Mbps)	NA
802.11ac20	MCS0 (6.5 Mbps)	NA
802.11ac40	MCS0 (13.5 Mbps)	NA
802.11ac80	MCS0 (29.3 Mbps)	NA
Transmitting mode:	Keep the EUT was programmed to be in continuously transmitting mode.	
Normal Link:	Keep the EUT operation to normal function.	

2.3 Support Unit used in test

Description	Manufacturer	Model	Serial Number
Adapter	JingSai	CLS-050200	3749567924
Development Board	Quectel	SMART-EVB-G5	MPY24F82X000339
Development Board	Quectel	SC200V-NA-TE-A	E1C25AB0B000094
Remark: all above the information of table are provided by client.			

2.4 Test Environment

Temperature:	Normal: 15°C ~ 35°C
Humidity:	45-56 % RH Ambient
Voltage:	DC 3.8V (Module Input)
Remark: The testing environment is within the scope of the EUT user manual and meets the requirements of the standard testing environment.	

2.5 Test RF Cable

For all conducted test items: The offset level is set spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

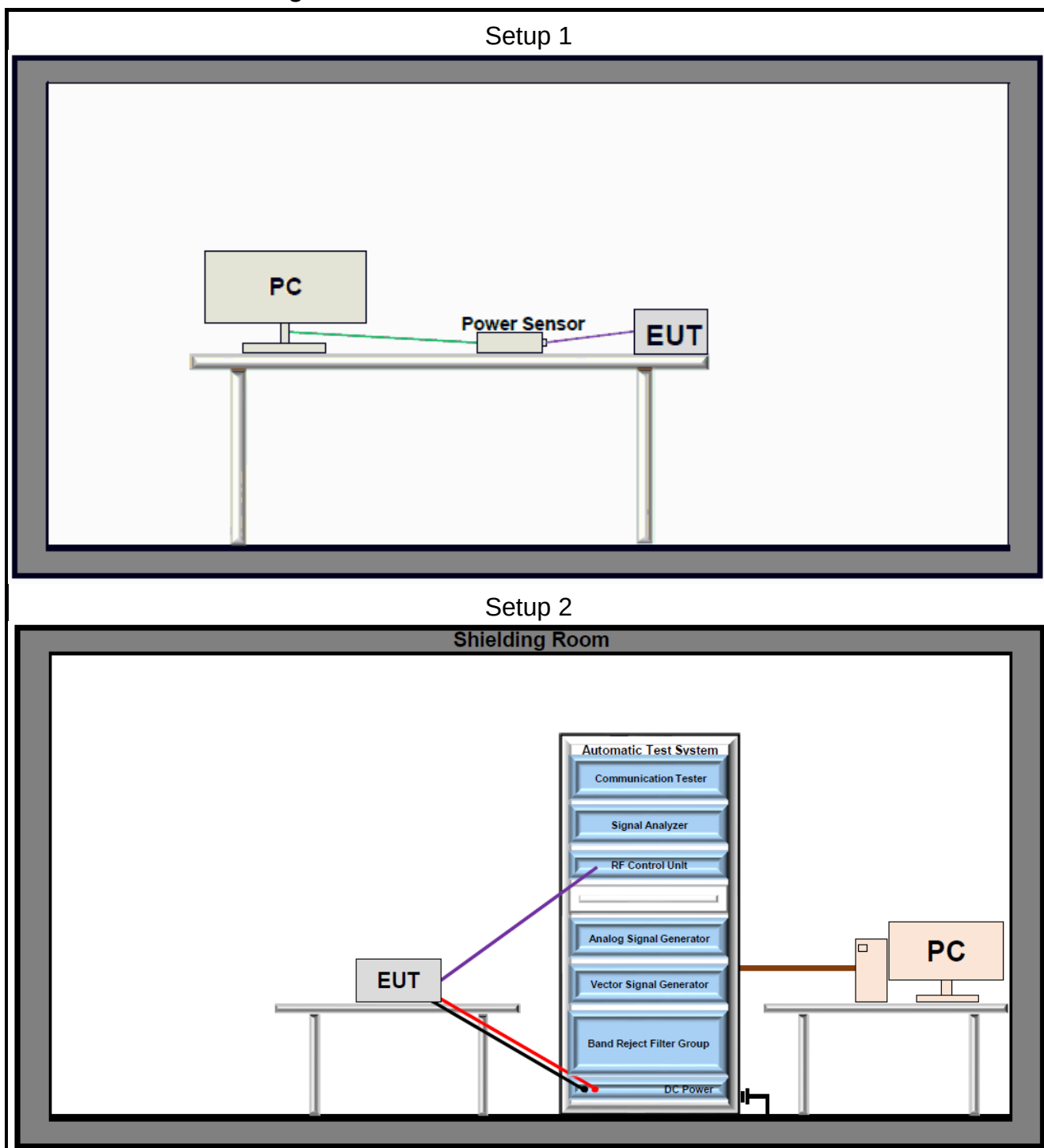
Offset = RF cable loss + attenuator factor.

2.6 Modifications

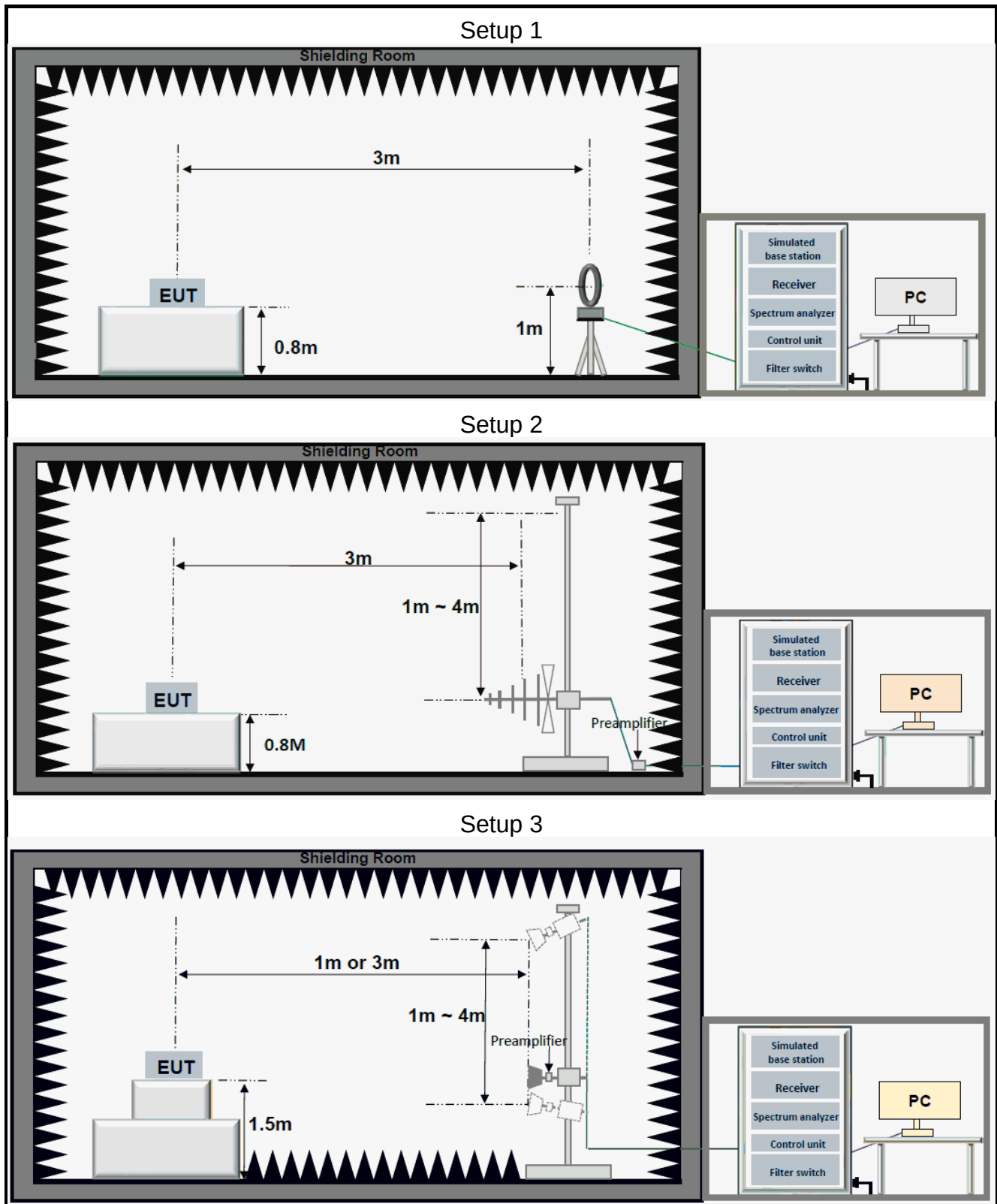
No modifications were made during testing.

2.7 Test Setup Diagram

2.7.1 Conducted Configuration



2.7.2 Radiated Configuration



3 Equipment and Measurement Uncertainty

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, whichever is less, and where applicable is traceable to recognized national standards.

3.1 Test Equipment List

Description	Manufacturer	Model	SN	Last Due	Cal Due
Signal Analyzer	Keysight	N9020A	US46470429	2024/03/25	2025/03/24
Power Sensor	Anritsu	MA24408A	12520	2024/05/30	2025/05/29
Measurement Software	Tonscend	TS1120-3	10659	N/A	N/A

Radiated Emission					
Description	Manufacturer	Model	SN	Last Due	Cal Due
Biconic Logarithmic Periodic Antennas	Schwarzbeck	VULB9163	1643	2023/06/25	2025/06/24
Double-Ridged Horn Antennas	Schwarzbeck	BBHA 9120D	2809	2023/06/25	2025/06/24
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	1290	2023/06/25	2025/06/24
Loop Antenna	Schwarzbeck	FMZB 1519C	1519C-028	2023/06/29	2025/06/28
Signal Analyzer	Keysight	N9020A	MY49100252	2024/03/25	2025/03/24
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY63440541	2024/05/30	2025/05/29
Wideband Radio Communication Tester	R&S	CMW500	150645	2024/03/25	2025/03/24
Low Noise Amplifier	Tonscend	TAP9K3G40	AP23A8060273	2023/04/08	2025/04/07
Low Noise Amplifier	Tonscend	TAP01018050	AP22G806258	2023/04/08	2025/04/07
Low Noise Amplifier	Tonscend	TAP18040048	AP22G806247	2023/04/08	2025/04/07
Hygrometer	BINGYU	HTC-1	N/A	2023/06/01	2025/05/31
Test Software	Tonscend	TS+	Version: 5.0.0	N/A	N/A

3.2 Measurement Uncertainty

Parameter	U _{lab}
Frequency Error	679.98Hz
Output Power	0.76dB
Conducted Spurious Emissions	2.22dB
Radiated Emissions(9kHz~30MHz)	2.40dB
Radiated Emissions(30MHz~1000MHz)	4.66dB
Radiated Emissions(1GHz~18GHz)	5.42dB
Radiated Emissions(18GHz~40GHz)	5.46dB

Uncertainty figures are valid to a confidence level of 95%

4 Test Results

4.1 Antenna Requirement

Standard Applicable:	47 CFR Part 15C Section 15.203
15.203 requirement: 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
The antenna gain and type as provided by the manufacturer are as follows: The antenna Type is Dipole. With maximum gain is U-NII-1: -0.67dBi; U-NII-2A: -0.19dBi; U-NII-2C: 1.28dBi; U-NII-3: 1.1dBi; Antenna Anti-Replacement Construction: An embedded-in antenna design is used.	

4.2 Frequency Stability

Standard Applicable:	47 CFR Part 15C Section 15.407(g)
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 user's manual.	

4.3 Maximum Conducted Output Power

Limits

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Test Procedure

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section II.E.2.b (Other Channel)

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section II.E.3.b (Straddle Channel)

Test Settings

1. PM-G:
Set to the maximum power setting and enable the EUT transmit continuously.
The power output was measured on the EUT antenna port using RF Cable with attenuator connected to a power meter via wideband power sensor. Peak output power was read directly from power meter.
Measure and record the results in the test report.
2. SA:
RBW = 1MHz
VBW $\geq$ 3MHz
Span = Encompass the EBW (or, alternatively, the entire 99% occupied bandwidth)
Sweep = Auto
Detector = power averaging (rms)

Test Setup

Refer to section 2.7.1 Setup 1 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix**.

4.4 Emission Bandwidth

Limits

None, for reporting purposes only.

Test Procedure

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section II.C.1.

Test Settings

1. Set to the maximum power setting and enable the EUT transmit continuously.
2. The transmitter output is connected to a spectrum analyzer:
3. RBW = 1% - 5%(99%BW)
4. VBW = 3 times the RBW
5. Sweep = Auto
6. Detector = Peak
7. Trace = Max hold
8. The trace was allowed to stabilize
9. Measure and record the results in the test report.

Test Notes

The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X= 26. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.

Test Setup

Refer to section 2.7.1 Setup 2 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix**.

4.5 Minimum Emission Bandwidth

Limits

Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section II.C.2.

Test Settings

1. Set to the maximum power setting and enable the EUT transmit continuously.
2. The transmitter output is connected to a spectrum analyzer:
3. RBW = 100kHz(DTS)
4. VBW = 3 times the RBW
5. Sweep = Auto
6. Detector = Peak
7. Trace = Max hold
8. The trace was allowed to stabilize
9. Measure and record the results in the test report.

Test Notes

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Setup

Refer to section 2.7.1- Setup 2 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix**.

4.6 Occupied Bandwidth

Limits

None, for reporting purposes only.

Test Procedure

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section II.D.

Test Settings

1. Set to the maximum power setting and enable the EUT transmit continuously.
2. The transmitter output is connected to a spectrum analyzer:
3. RBW = 1% - 5%(99%BW)
4. VBW = 3 times the RBW
5. Sweep = Auto
6. Detector = Peak
7. Trace = Max hold
8. The trace was allowed to stabilize
9. Measure and record the results in the test report.

Test Setup

Refer to section 2.7.1- Setup 2 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix**.

4.7 Maximum Power Spectral Density

Limits

For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1-megahertz band.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1-megahertz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

Test Procedure

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section II.F

Test Settings

1. Set to the maximum power setting and enable the EUT transmit continuously
2. The transmitter output is connected to a spectrum analyzer
3. RBW = 1MHz (for 5.15–5.25 GHz, 5.25–5.35 GHz, and 5.47–5.725 GHz)
4. RBW = 500kHz (for 5.725–5.85 GHz)
5. VBW $\geq$ 3 times RBW
6. Sweep = Auto
7. Detector = Peak
8. Trace = Max hold
9. The trace was allowed to stabilize
10. Measure and record the results in the test report.

Test Setup

Refer to section 2.7.1- Setup 2 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix**.

4.8 Unwanted Emissions

Limits

Spurious emissions are permitted in an of the frequency bands:

MHz	MHz	MHz	MHz	GHz	GHz
0.090 - 0.110	12.29 - 12.293	149.9 - 150.05	1660 - 1710	4.5 - 5.15	14.47 - 14.5
0.495 - 0.505	12.51975 - 12.52025	156.52475 - 156.52525	1718.8 - 1722.2	5.35 - 5.46	15.35 - 16.2
2.1735 - 2.1905	12.5767 - 12.57725	156.7 - 156.9	2200 - 2300	7.25 - 7.75	17.7 - 21.4
4.125 - 128	13.36 - 13.41	162.0125 - 167.17	2310 - 2390	8.025 - 8.5	22.01 - 23.12
4.17725 - 4.17775	16.42 - 16.423	167.72 - 173.2	2483.5 - 2500	9.0 - 9.2	23.6 - 24.0
4.20725 - 4.20775	16.69475 - 16.69525	240 - 285	2655 - 2900	9.3 - 9.5	31.2 - 31.8
6.215 - 6.218	1680425 - 1680475	322 - 335.4	3260 - 3267	10.6 - 12.7	36.43 - 36.5
6.26775 - 6.26825	25.5 - 25.67	399.9 - 410	3332 - 3339	13.25 - 13.4	
6.31175 - 6.31225	37.5 - 38.25	608 - 614	3345.8 - 3358		
8.291 - 8.294	73 - 74.6	960 - 1240	3600 - 4400		
8.362 - 8.366	74.8 - 75.2	1300 - 1427			
8.37625 - 8.38675	108 - 121.94	1435 - 1626.5			
8.41425 - 8.41475	123 - 138	1645.5 - 1646.5			

Radiated disturbance of an intentional radiator:

Frequency	Field strength ($\mu\text{V/m}$)	Limit (dB $\mu\text{V/m}$)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	74.0	Peak	3
		54.0	Average	

Un-restricted band emissions above 1GHz 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 solely in the 5.725-5.850 GHz band:

All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Test Procedure

ANSI C63.10:2020 Section 6.4 & 6.5 & 6.6.

KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section II.G.3 ~ 6.

Test Settings

1. For radiated emissions measurements performed at frequencies less than or equal to 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the reference ground plane.
2. For radiated emissions measurements performed at frequencies above 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the ground plane.
3. Radiated measurements shall be made with the measurement antenna positioned in both horizontal and vertical polarization. The measurement antenna shall be varied from 1m to 4m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level (i.e, field strength or received power), when orienting the measurement antenna in vertical polarization, the minimum height of the lowest element of the antenna shall clear the site reference ground plane by at least 25cm.
4. For each suspected emission, the EUT was ranged its worst case and then tune the antenna tower(from 1~4m) and turntable(from 0~360°) find the maximum reading. Preamplifier and a high pass filter are used for the test in order get better signal level comply with the guidelines.
5. The simulated base station was set to force the EUT to its maximum transmitting power.
6. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
7. spectrum analyzer setting:
Measurements Below 1000MHz: RBW = 120 kHz; VBW ≥ 300 kHz; Detector = Peak
Measurements Above 1000MHz: RBW = 1 MHz; VBW ≥ 3 MHz; Detector = Peak
Average Measurements Above 1000MHz:
RBW = 1 MHz, VBW ≥ 1/T, with peak detector for average measurements.
8. The field strength is calculated by adding the Antenna Factor, Cable Factor. The basic equation with a sample calculation is as follows:
Level = Reading(dBμV) + AF(dB/m) + Factor(dB):
AF = Antenna Factor(dB/m)
Factor = Cable Factor(dB) - Preamplifier gain(dB)
Margin = Limit(dBμV/m) – Level(dBμV/m)
9. Repeat above procedures until all frequencies measured was complete.
10. Measure and record the results in the test report.

Test Notes

1. Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1-meter test distance with the application of a distance correction factor.
2. Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. the disturbance between 9kHz to 30MHz, 30MHz-1GHz and 18GHz to 40GHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be recorded, so only the harmonics had been displayed.
3. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Test Setup

Refer to section 2.7.2 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix**.

5 Test Setup Photos

The detailed test data see: **Appendix-C BTWIFI Setup Photos**

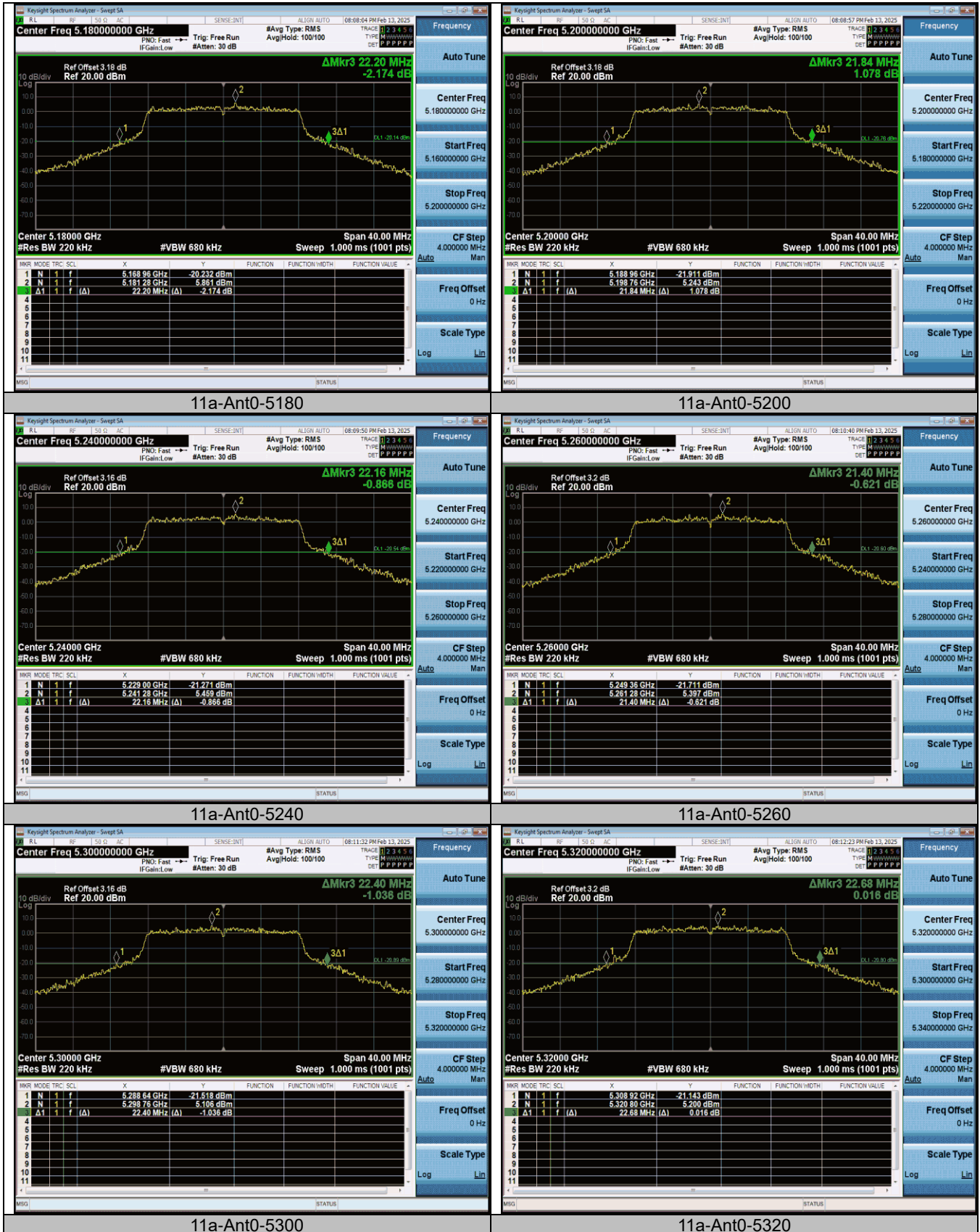
Appendix

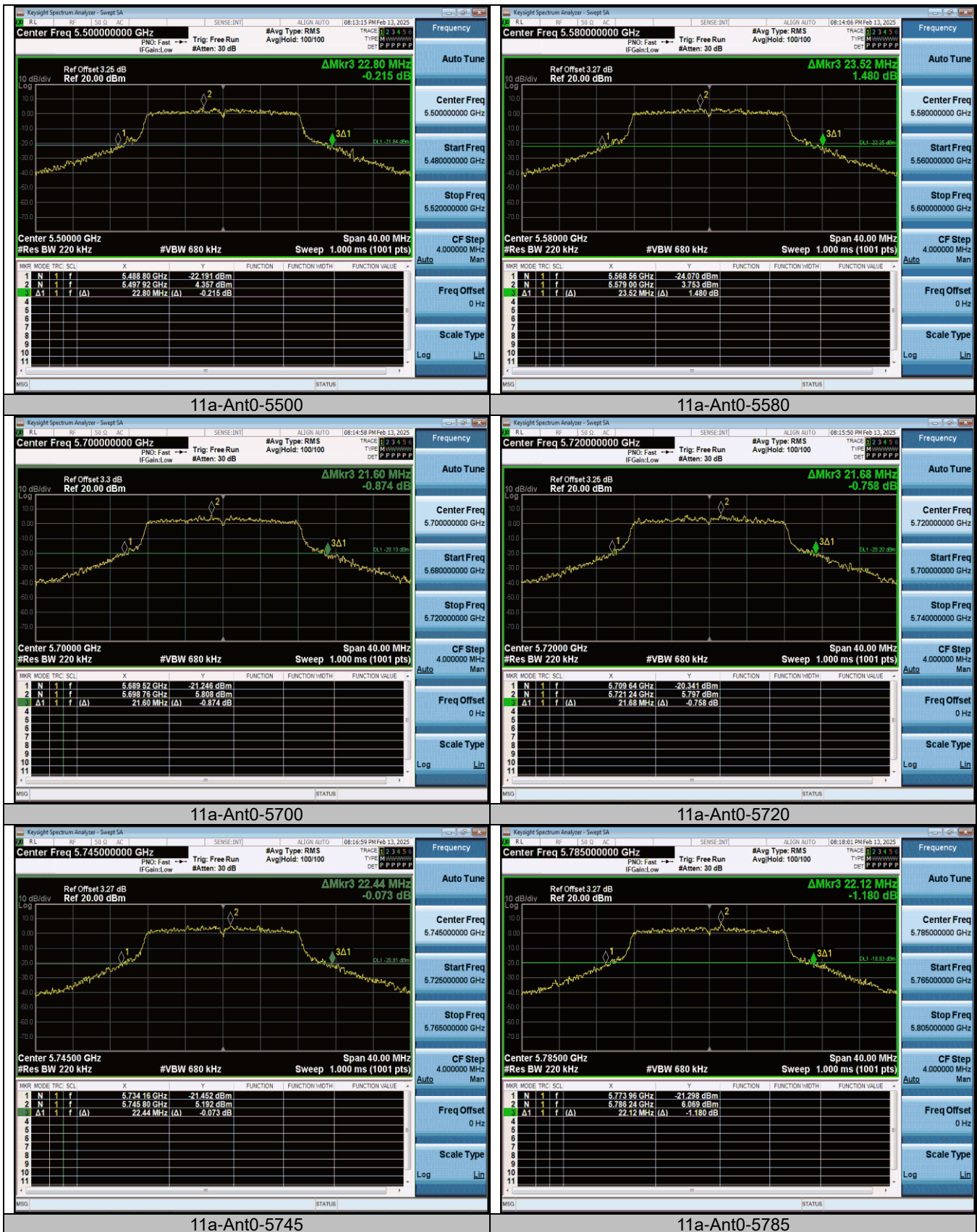
Emission Bandwidth Test Result

TestMode	Antenna	Frequency[MHz]	26dB EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11a	Ant0	5180	22.200	5168.960	5191.160	---	---
11a	Ant0	5200	21.840	5188.960	5210.800	---	---
11a	Ant0	5240	22.160	5229.000	5251.160	---	---
11a	Ant0	5260	21.400	5249.360	5270.760	---	---
11a	Ant0	5300	22.400	5288.640	5311.040	---	---
11a	Ant0	5320	22.680	5308.920	5331.600	---	---
11a	Ant0	5500	22.800	5488.800	5511.600	---	---
11a	Ant0	5580	23.520	5568.560	5592.080	---	---
11a	Ant0	5700	21.600	5689.520	5711.120	---	---
11a	Ant0	5720	21.680	5709.640	5731.320	---	---
11a	Ant0	5720 UNII-2C	15.36	5709.640	5725	---	---
11a	Ant0	5720 UNII-3	6.32	5725	5731.320	---	---
11a	Ant0	5745	22.440	5734.160	5756.600	---	---
11a	Ant0	5785	22.120	5773.960	5796.080	---	---
11a	Ant0	5825	22.120	5813.960	5836.080	---	---
11n20SISO	Ant0	5180	22.560	5169.160	5191.720	---	---
11n20SISO	Ant0	5200	22.120	5188.880	5211.000	---	---
11n20SISO	Ant0	5240	22.280	5228.680	5250.960	---	---
11n20SISO	Ant0	5260	22.880	5248.880	5271.760	---	---
11n20SISO	Ant0	5300	22.760	5288.960	5311.720	---	---
11n20SISO	Ant0	5320	21.560	5309.480	5331.040	---	---
11n20SISO	Ant0	5500	22.000	5489.000	5511.000	---	---
11n20SISO	Ant0	5580	22.960	5568.560	5591.520	---	---
11n20SISO	Ant0	5700	22.520	5689.040	5711.560	---	---
11n20SISO	Ant0	5720	23.120	5708.600	5731.720	---	---
11n20SISO	Ant0	5720 UNII-2C	16.4	5708.600	5725	---	---
11n20SISO	Ant0	5720 UNII-3	6.72	5725	5731.720	---	---
11n20SISO	Ant0	5745	22.480	5734.280	5756.760	---	---
11n20SISO	Ant0	5785	23.160	5773.600	5796.760	---	---
11n20SISO	Ant0	5825	23.720	5813.640	5837.360	---	---
11n40SISO	Ant0	5190	41.760	5169.760	5211.520	---	---
11n40SISO	Ant0	5230	41.440	5209.840	5251.280	---	---
11n40SISO	Ant0	5270	41.120	5249.680	5290.800	---	---
11n40SISO	Ant0	5310	41.200	5289.680	5330.880	---	---
11n40SISO	Ant0	5510	40.880	5489.680	5530.560	---	---
11n40SISO	Ant0	5550	41.680	5529.840	5571.520	---	---
11n40SISO	Ant0	5670	40.720	5649.840	5690.560	---	---
11n40SISO	Ant0	5710	41.680	5689.840	5731.520	---	---
11n40SISO	Ant0	5710 UNII-2C	35.16	5689.840	5725	---	---
11n40SISO	Ant0	5710 UNII-3	6.52	5725	5731.520	---	---
11n40SISO	Ant0	5755	41.840	5734.600	5776.440	---	---
11n40SISO	Ant0	5795	41.760	5774.440	5816.200	---	---
11ac20SISO	Ant0	5180	23.000	5168.760	5191.760	---	---
11ac20SISO	Ant0	5200	22.760	5188.680	5211.440	---	---
11ac20SISO	Ant0	5240	23.040	5228.800	5251.840	---	---
11ac20SISO	Ant0	5260	22.680	5248.720	5271.400	---	---
11ac20SISO	Ant0	5300	22.800	5288.560	5311.360	---	---
11ac20SISO	Ant0	5320	22.920	5308.960	5331.880	---	---
11ac20SISO	Ant0	5500	23.640	5487.880	5511.520	---	---
11ac20SISO	Ant0	5580	22.120	5568.920	5591.040	---	---
11ac20SISO	Ant0	5700	22.840	5688.800	5711.640	---	---
11ac20SISO	Ant0	5720	22.000	5709.120	5731.120	---	---
11ac20SISO	Ant0	5720 UNII-2C	15.88	5709.120	5725	---	---
11ac20SISO	Ant0	5720 UNII-3	6.12	5725	5731.120	---	---
11ac20SISO	Ant0	5745	23.120	5733.840	5756.960	---	---

11ac20SISO	Ant0	5785	22.000	5773.800	5795.800	---	---
11ac20SISO	Ant0	5825	22.000	5814.000	5836.000	---	---
11ac40SISO	Ant0	5190	40.880	5169.680	5210.560	---	---
11ac40SISO	Ant0	5230	41.200	5209.520	5250.720	---	---
11ac40SISO	Ant0	5270	41.360	5249.120	5290.480	---	---
11ac40SISO	Ant0	5310	41.280	5289.360	5330.640	---	---
11ac40SISO	Ant0	5510	40.960	5489.760	5530.720	---	---
11ac40SISO	Ant0	5550	40.880	5529.680	5570.560	---	---
11ac40SISO	Ant0	5670	41.120	5649.600	5690.720	---	---
11ac40SISO	Ant0	5710	40.960	5689.520	5730.480	---	---
11ac40SISO	Ant0	5710 UNII-2C	35.48	5689.520	5725	---	---
11ac40SISO	Ant0	5710 UNII-3	5.48	5725	5730.480	---	---
11ac40SISO	Ant0	5755	41.200	5734.440	5775.640	---	---
11ac40SISO	Ant0	5795	40.640	5774.920	5815.560	---	---
11ac80SISO	Ant0	5210	81.600	5169.680	5251.280	---	---
11ac80SISO	Ant0	5290	82.560	5248.560	5331.120	---	---
11ac80SISO	Ant0	5530	83.040	5488.560	5571.600	---	---
11ac80SISO	Ant0	5610	82.400	5568.880	5651.280	---	---
11ac80SISO	Ant0	5690	82.720	5648.560	5731.280	---	---
11ac80SISO	Ant0	5690 UNII-2C	76.44	5648.560	5725	---	---
11ac80SISO	Ant0	5690 UNII-3	6.28	5725	5731.280	---	---
11ac80SISO	Ant0	5775	82.560	5733.240	5815.800	---	---

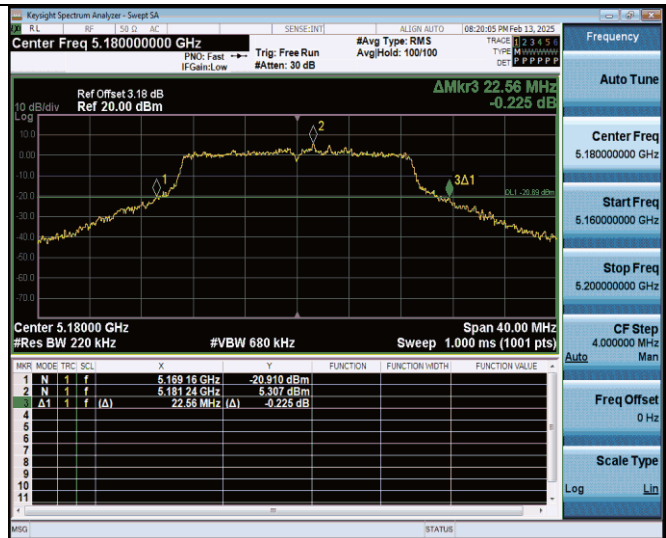
Test Graphs







11a-Ant0-5825



11n20SISO-Ant0-5180



11n20SISO-Ant0-5200



11n20SISO-Ant0-5240



11n20SISO-Ant0-5260



11n20SISO-Ant0-5300



11n20SISO-Ant0-5320



11n20SISO-Ant0-5500



11n20SISO-Ant0-5580



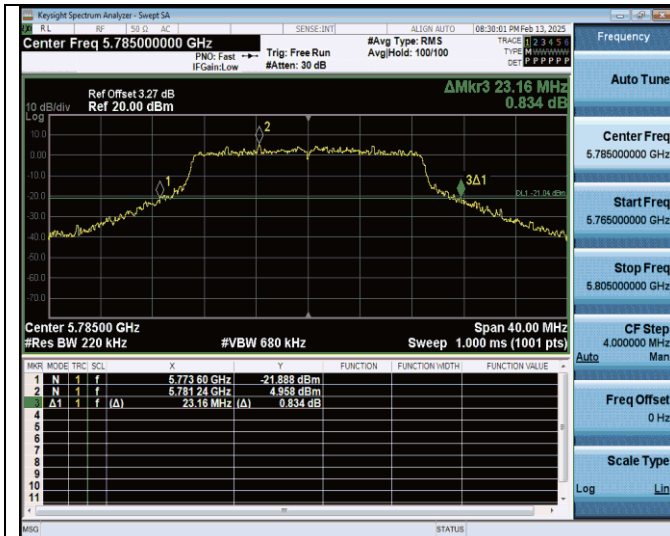
11n20SISO-Ant0-5700



11n20SISO-Ant0-5720



11n20SISO-Ant0-5745



11n20SISO-Ant0-5785



11n20SISO-Ant0-5825



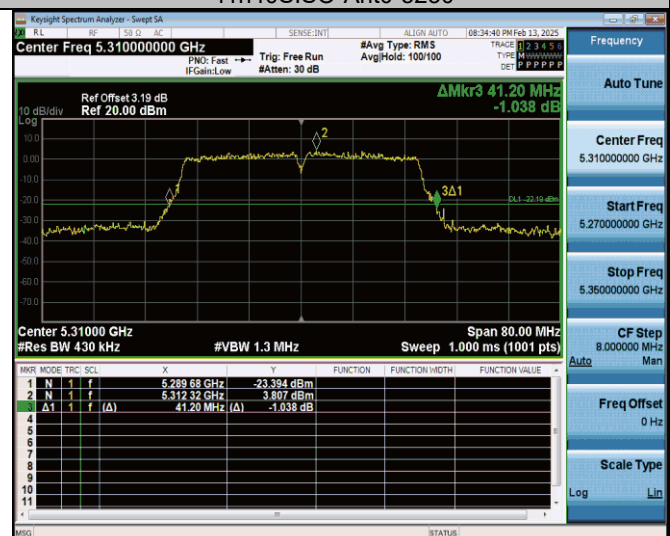
11n40SISO-Ant0-5190



11n40SISO-Ant0-5230



11n40SISO-Ant0-5270



11n40SISO-Ant0-5310

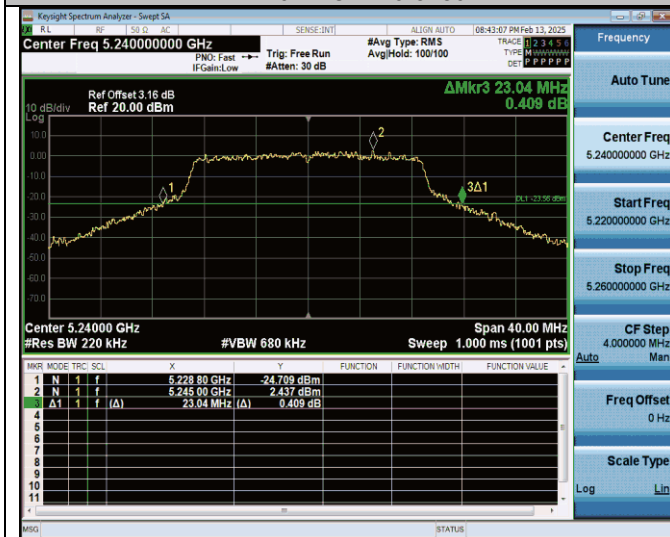




11ac20SISO-Ant0-5180



11ac20SISO-Ant0-5200



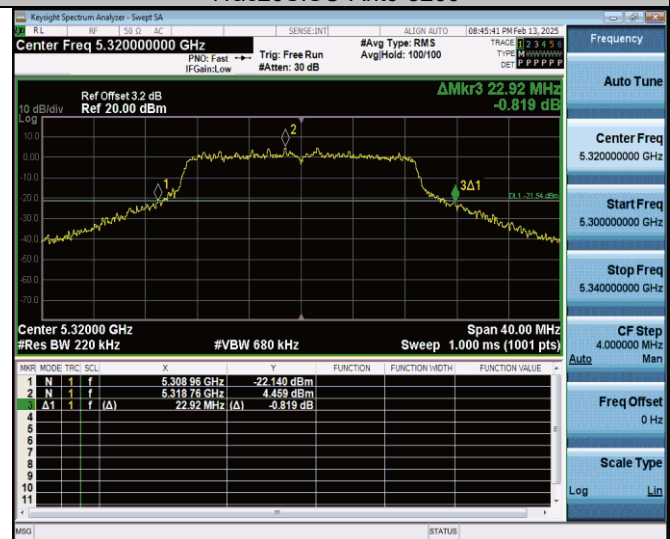
11ac20SISO-Ant0-5240



11ac20SISO-Ant0-5260



11ac20SISO-Ant0-5300



11ac20SISO-Ant0-5320







11ac40SISO-Ant0-5550



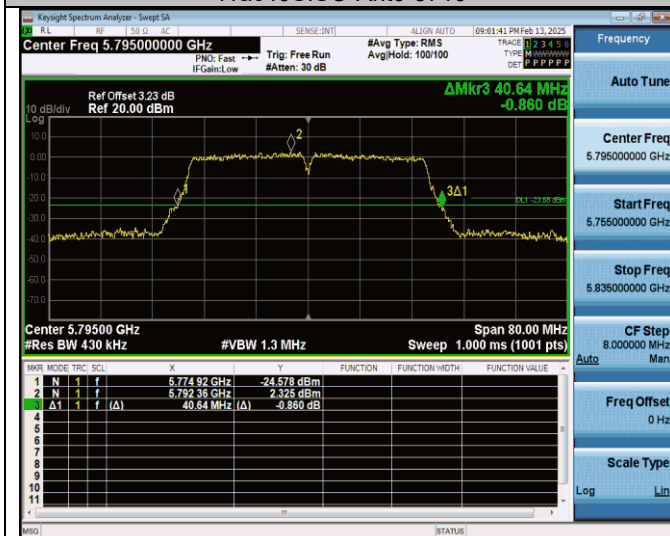
11ac40SISO-Ant0-5670



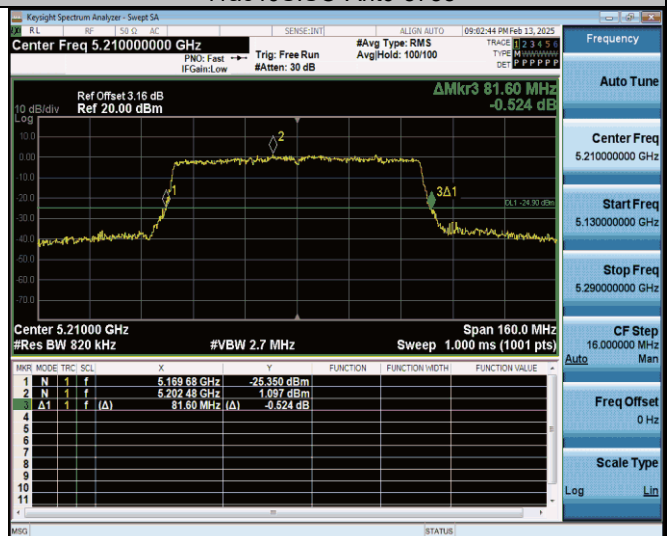
11ac40SISO-Ant0-5710



11ac40SISO-Ant0-5755



11ac40SISO-Ant0-5795



11ac80SISO-Ant0-5210



Occupied channel bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11a	Ant0	5180	16.829	5171.6144	5188.4434	---	---
11a	Ant0	5200	16.863	5191.5779	5208.4409	---	---
11a	Ant0	5240	16.904	5231.5637	5248.4677	---	---
11a	Ant0	5260	16.869	5251.5462	5268.4152	---	---
11a	Ant0	5300	16.924	5291.5586	5308.4826	---	---
11a	Ant0	5320	16.870	5311.5850	5328.4550	---	---
11a	Ant0	5500	16.902	5491.5491	5508.4511	---	---
11a	Ant0	5580	16.889	5571.5612	5588.4502	---	---
11a	Ant0	5700	16.930	5691.5422	5708.4722	---	---
11a	Ant0	5720	16.885	5711.5622	5728.4472	---	---
11a	Ant0	5720 UNII-2C	13.438	5711.5622	5725	---	---
11a	Ant0	5720 UNII-3	3.447	5725	5728.4472	---	---
11a	Ant0	5745	16.924	5736.5391	5753.4631	---	---
11a	Ant0	5785	16.871	5776.5407	5793.4117	---	---
11a	Ant0	5825	16.900	5816.5433	5833.4433	---	---
11n20SISO	Ant0	5180	18.018	5171.0286	5189.0466	---	---
11n20SISO	Ant0	5200	18.048	5190.9961	5209.0441	---	---
11n20SISO	Ant0	5240	18.063	5230.9989	5249.0619	---	---
11n20SISO	Ant0	5260	18.025	5251.0044	5269.0294	---	---
11n20SISO	Ant0	5300	18.038	5291.0080	5309.0460	---	---
11n20SISO	Ant0	5320	17.995	5311.0298	5329.0248	---	---
11n20SISO	Ant0	5500	18.059	5490.9863	5509.0453	---	---
11n20SISO	Ant0	5580	18.029	5571.0160	5589.0450	---	---
11n20SISO	Ant0	5700	18.054	5690.9990	5709.0530	---	---
11n20SISO	Ant0	5720	18.026	5711.0145	5729.0405	---	---
11n20SISO	Ant0	5720 UNII-2C	13.985	5711.0145	5725	---	---
11n20SISO	Ant0	5720 UNII-3	4.041	5725	5729.0405	---	---
11n20SISO	Ant0	5745	18.024	5735.9987	5754.0227	---	---
11n20SISO	Ant0	5785	17.984	5776.0140	5793.9980	---	---
11n20SISO	Ant0	5825	18.032	5816.0027	5834.0347	---	---
11n40SISO	Ant0	5190	36.449	5171.8620	5208.3110	---	---
11n40SISO	Ant0	5230	36.430	5211.8808	5248.3108	---	---
11n40SISO	Ant0	5270	36.454	5251.8125	5288.2665	---	---
11n40SISO	Ant0	5310	36.373	5291.8848	5328.2578	---	---
11n40SISO	Ant0	5510	36.506	5491.8468	5528.3528	---	---
11n40SISO	Ant0	5550	36.459	5531.8371	5568.2961	---	---
11n40SISO	Ant0	5670	36.432	5651.8430	5688.2750	---	---
11n40SISO	Ant0	5710	36.455	5691.8697	5728.3247	---	---
11n40SISO	Ant0	5710 UNII-2C	33.13	5691.8697	5725	---	---
11n40SISO	Ant0	5710 UNII-3	3.325	5725	5728.3247	---	---
11n40SISO	Ant0	5755	36.512	5736.8023	5773.3143	---	---
11n40SISO	Ant0	5795	36.465	5776.7969	5813.2619	---	---
11ac20SISO	Ant0	5180	18.044	5171.0140	5189.0580	---	---
11ac20SISO	Ant0	5200	18.062	5190.9815	5209.0435	---	---
11ac20SISO	Ant0	5240	18.058	5230.9774	5249.0354	---	---
11ac20SISO	Ant0	5260	18.070	5250.9767	5269.0467	---	---
11ac20SISO	Ant0	5300	18.091	5290.9765	5309.0675	---	---
11ac20SISO	Ant0	5320	18.013	5311.0212	5329.0342	---	---
11ac20SISO	Ant0	5500	18.053	5490.9851	5509.0381	---	---
11ac20SISO	Ant0	5580	18.078	5570.9963	5589.0743	---	---
11ac20SISO	Ant0	5700	18.048	5691.0000	5709.0480	---	---
11ac20SISO	Ant0	5720	18.052	5711.0139	5729.0659	---	---
11ac20SISO	Ant0	5720 UNII-2C	13.986	5711.0139	5725	---	---
11ac20SISO	Ant0	5720 UNII-3	4.066	5725	5729.0659	---	---
11ac20SISO	Ant0	5745	18.041	5735.9861	5754.0271	---	---
11ac20SISO	Ant0	5785	18.026	5775.9930	5794.0190	---	---
11ac20SISO	Ant0	5825	18.063	5815.9808	5834.0438	---	---
11ac40SISO	Ant0	5190	36.396	5171.8628	5208.2588	---	---
11ac40SISO	Ant0	5230	36.374	5211.8759	5248.2499	---	---
11ac40SISO	Ant0	5270	36.351	5251.8530	5288.2040	---	---
11ac40SISO	Ant0	5310	36.362	5291.8891	5328.2511	---	---
11ac40SISO	Ant0	5510	36.348	5491.8659	5528.2139	---	---

11ac40SISO	Ant0	5550	36.411	5531.8600	5568.2710	---	---
11ac40SISO	Ant0	5670	36.414	5651.8438	5688.2578	---	---
11ac40SISO	Ant0	5710	36.376	5691.8505	5728.2265	---	---
11ac40SISO	Ant0	5710 UNII-2C	33.15	5691.8505	5725	---	---
11ac40SISO	Ant0	5710 UNII-3	3.226	5725	5728.2265	---	---
11ac40SISO	Ant0	5755	36.413	5736.7949	5773.2079	---	---
11ac40SISO	Ant0	5795	36.371	5776.8191	5813.1901	---	---
11ac80SISO	Ant0	5210	75.694	5172.3087	5248.0027	---	---
11ac80SISO	Ant0	5290	75.810	5252.1725	5327.9825	---	---
11ac80SISO	Ant0	5530	75.737	5492.2463	5567.9833	---	---
11ac80SISO	Ant0	5610	75.698	5572.2445	5647.9425	---	---
11ac80SISO	Ant0	5690	75.740	5652.1623	5727.9023	---	---
11ac80SISO	Ant0	5690 UNII-2C	72.838	5652.1623	5725	---	---
11ac80SISO	Ant0	5690 UNII-3	2.902	5725	5727.9023	---	---
11ac80SISO	Ant0	5775	75.665	5737.1041	5812.7691	---	---

Test Graphs

