

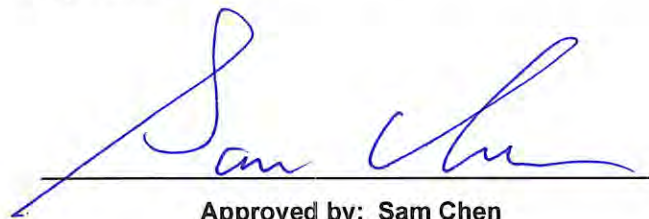


RADIO TEST REPORT

FCC ID : 2ACIX-AIOS9
Equipment : wireless module
Brand Name : Bowers & Wilkins
Model Name : AIOS 9.0
Applicant : B&W Group Ltd.
Dale Road, Worthing, West Sussex BN11 2BH,
United Kingdom
Manufacturer : B&W Group Ltd.
Dale Road, Worthing, West Sussex BN11 2BH,
United Kingdom
Standard : 47 CFR FCC Part 15.407

The product was received on Oct. 24, 2024, and testing was started from Dec. 04, 2024 and completed on Dec. 12, 2024. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2020 and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A12_1 Ver1.4

Page Number : 3 of 20
Issued Date : Nov. 17, 2025
Report Version : 01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.407(a)	Maximum Output Power	PASS	-
3.2	15.407(a)	Power Spectral Density	PASS	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

1. The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.
2. The test configuration, test mode and test software were written in this test report are declared by the manufacturer.

Reviewed by: Sam Chen**Report Producer: Vicky Huang**

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std. 802.11	Ch. Frequency (MHz)	Channel Number
5150-5250	a, n (HT20)	5180-5240	36-48 [4]
5150-5250	n (HT40)	5190-5230	38-46 [2]

Band	Mode	BWch (MHz)	Nant
5.15-5.25GHz	802.11a	20	2TX
5.15-5.25GHz	802.11n HT20	20	2TX
5.15-5.25GHz	802.11n HT40	40	2TX

Note:

- ♦ 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- ♦ BWch is the nominal channel bandwidth.

**1.1.2 Antenna Information**

<Set 1>

Ant.	Port			Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)
	BT	WLAN 2.4/6GHz	WLAN 5GHz					
1	1	-	-	Radtenna Ltd.	ZZ40924	Dipole	IPEX	Note 1
2	-	1	-		ZZ44806			
3	-	2	-		ZZ44814			
4	-	-	2		ZZ44822			
5	-	-	1		ZZ44830			

Note 1:

Ant.	Max Peak Gain (dBi)				Cable Loss (dB)				Net Gain (dBi)			
	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz
1	2.2	-	-	-	0.9	-	-	-	1.3	-	-	-
2	-	2.3	-	3	-	0.6	-	1	-	1.7	-	2
3	-	2.1	-	2.4	-	0.8	-	1.3	-	1.3	-	1.1
4	-	-	1.9	-	-	-	1.3	-	-	-	0.6	-
5	-	-	2.8	-	-	-	1	-	-	-	1.8	-

<Set 2>

Ant.	Port			Brand Name	Model Name	Antenna Type	Connector	Gain (dBi)
	BT	WLAN 2.4/6GHz	WLAN 5GHz					
1	1	-	-	Radtenna Ltd.	ZZ45640	Slot	IPEX	Note 2
2	-	1	-		ZZ45659	Dipole		
3	-	2	-		ZZ45667			
4	-	-	2		ZZ45675			
5	-	-	1		ZZ45683			

Note 2:

Ant.	Max Peak Gain (dBi)				Cable Loss (dB)				Net Gain (dBi)			
	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz
1	1.8	-	-	-	0.4	-	-	-	1.4	-	-	-
2	-	2.3	-	3	-	0.3	-	0.4	-	2	-	2.6
3	-	2.1	-	2.4	-	0.3	-	0.4	-	1.8	-	2
4	-	-	1.9	-	-	-	0.4	-	-	-	1.5	-
5	-	-	1.9	-	-	-	0.5	-	-	-	1.4	-



<Set 3>

Ant.	Port			Brand Name	Model Name	Antenna Type	Connector	Cable	Gain (dBi)
	BT	WLAN 2.4/6GHz	WLAN 5GHz						
1	1	-	-	Radtenna Ltd.	ZZ44563	Dipole	IPEX	Note 3	Note 4
2	-	1	-		ZZ44571				
3	-	2	-		ZZ44598				
4	-	-	2		ZZ44601				
5	-	-	1		ZZ44601				

Note 3: The antennas in Set 3 do not originally contain cable. The information of antenna cables combined with them are listed below:

Combined Ant.	Brand Name	Model Name
1	ShenYu	ZX38008
2		ZX38016
3		ZX38024
4		ZX38032
5		ZX38040

Note 4:

Ant.	Max Peak Gain (dBi)				Cable Loss (dB)				Net Gain (dBi)			
	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	BT	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz
1	2.9	-	-	-	1.79	-	-	-	1.11	-	-	-
2	-	2.4	-	3.9	-	0.62	-	1.1	-	1.78	-	2.8
3	-	1.4	-	3.6	-	1.26	-	2.22	-	0.14	-	1.38
4	-	-	2	-	-	-	1.22	-	-	-	0.78	-
5	-	-	2	-	-	-	2.12	-	-	-	-0.12	-

Note 5: The above information was declared by manufacturer.

Note 6: Directional gain information

Type	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for N ANT ≤ 4	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$
BF	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

Ex.

Directional Gain (NSS1) formula :

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

$$NSS1(g1,1) = 10^{G1/20} ; NSS1(g1,2) = 10^{G2/20};$$

$$g_{j,k} = (NSS1(g1,1) + NSS1(g1,2))^2$$

$$DG = 10 \log[(NSS1(g1,1) + NSS1(g1,2))^2 / N_{ANT}] \Rightarrow 10 \log[(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}]$$

Where ;

$$2.4G \ G1 = 2 \text{ dBi}; \ G2 = 1.8 \text{ dBi}; \ DG = 4.91 \text{ dBi}$$

$$5G \ G1 = 1.5 \text{ dBi}; \ G2 = 1.4 \text{ dBi}; \ DG = 4.46 \text{ dBi}$$

$$6G \ G1 = 2.6 \text{ dBi}; \ G2 = 2 \text{ dBi}; \ DG = 5.32 \text{ dBi}$$



Note 7: The EUT has three sets of antenna and there are five antennas for each set.

For RF Conducted tests:

For PSD, only antenna sets listed below with the highest gain among all antenna sets were selected to test:

For 2.4GHz/6GHz: Set 2, Ant. 2~3.

For 5GHz: Set 2, Ant. 4~5.

For Bluetooth: Set 2, Ant. 1.

For Output Power, only antennas listed below with the highest peak gain were selected to test:

For 2.4GHz: Set 2, Ant. 2.

For 5GHz: Set 1, Ant. 5.

For 6GHz: Set 3, Ant. 2.

For Bluetooth: Set 2, Ant. 1.

For Radiated tests, only antennas listed below with higher directional gain than other same type of antennas were selected to test:

For 2.4GHz/6GHz: Set 2, Ant. 2~3.

For 5GHz: Set 2, Ant. 4~5.

For Bluetooth: Set 1, Ant. 1 and Set 2, Ant. 1.

Note 8: **For 2.4GHz function:**

For IEEE 802.11 b/g/n/VHT/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For 6GHz function:

For IEEE 802.11 a/ax (2TX/2RX):

Port 1 and Port 2 can be used as transmitting/receiving antenna.

Port 1 and Port 2 could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving antenna.

**1.1.3 Mode Test Duty Cycle**

Mode	DC	DCF (dB)	T (s)	VBW (Hz)_1/T
802.11a_Nss 1,(6D)	0.985	0.07	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11n HT20_Nss 1,(M0)	0.983	0.07	n/a (DC>=0.98)	n/a (DC>=0.98)
802.11n HT40_Nss 1,(M0)	0.983	0.07	n/a (DC>=0.98)	n/a (DC>=0.98)

Note:

- ♦ DC is Duty Cycle.
- ♦ DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

EUT Power Type	From host system			
Beamforming Function	☐	With beamforming	☒	Without beamforming
Function	☐	Outdoor P2M	☒	Indoor P2M
	☐	Fixed P2P	☒	Client
	☒	Point-to-multipoint	☐	Point-to-point
Test Software Version	DOS [ver 6.1.7601]			

Note: The above information was declared by manufacturer.

1.1.5 Table for Component Source Information

Source	eMMC (Location: U9)
Main	Brand: SAMSUNG / Model: KLM8G1GETF-B041
Second	Brand: KIOXIA / Model: THGBMUG6C1LBAIL

Note: The above information was declared by manufacturer.

1.1.6 Table for EUT Information

The EUTs are identical to each other except for differences listed below:

EUT	eMMC (Location: U9)
1	Main source
2	Second source

Note: The above information was declared by manufacturer.

1.1.7 Table for EUT Function

Function	Support Type	Support Band
AP	Master	5GHz UNII 1
Station	Client without radar detection	2.4GHz, 5GHz UNII 1, 6GHz UNII 5~8

Note: The above information was declared by manufacturer.



1.2 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FR4O2328AD

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Antenna Set 1, Ant. 4 (Model: ZZ44822): Revised the antenna cable loss, peak gain, and net gain values for the 5 GHz band. 2. Antenna Set 1, Ant. 5 (Model: ZZ44830): Revised the antenna cable length (From 298mm to 340mm), peak gain, and net gain values for the 5 GHz band. 3. Antenna Set 2, Ant. 4 (Model: ZZ45675): Revised the antenna cable loss, peak gain, and net gain values for the 5 GHz band. 4. Antenna Set 2, Ant. 5 (Model: ZZ45683): Revised the antenna cable loss, peak gain, and net gain values for the 5 GHz band. Note: Only the values were revised; the antenna hardware remains unchanged. The revision is due to a data correction in the original antenna specification.	Used the correct antenna gain to evaluate the following items: 1. Maximum Output Power 2. Power Spectral Density It does not affect the test.
5. Update the reference standard to "ANSI C63.10-2020" from "ANSI C63.10-2013".	After evaluating, it does not affect the test.

1.3 Applicable Standards

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

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2020
- ♦ FCC KDB 789033 D02 v02r01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ FCC KDB 662911 D01 v02r01
- ♦ FCC KDB 412172 D01 v01r01
- ♦ FCC KDB 414788 D01 v01r01

1.4 Testing Location Information

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH03-CB	Brian Sun	22.6~24.2 / 61~64	Dec. 04, 2024~ Dec. 12, 2024



1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Test Items	Uncertainty	Remark
Conducted Emission	3.1 dB	Confidence levels of 95%
Output Power Measurement	0.8 dB	Confidence levels of 95%
Power Density Measurement	3.1 dB	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Mode
802.11a_Nss1,(6Mbps)_2TX
5180MHz
5200MHz
5240MHz
802.11n HT20_Nss1,(MCS0)_2TX
5180MHz
5200MHz
5240MHz
802.11n HT40_Nss1,(MCS0)_2TX
5190MHz
5230MHz

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests		
Tests Item	Maximum Output Power	
Test Condition	Conducted measurement at transmit chains	
Operating Mode	1	EUT 1 + Ant. Set 1_AP mode
	2	EUT 1 + Ant. Set 1_Station mode

The Worst Case Mode for Following Conformance Tests		
Tests Item	Power Spectral Density	
Test Condition	Conducted measurement at transmit chains	
Operating Mode	1	EUT 1 + Ant. Set 2_AP mode
	2	EUT 1 + Ant. Set 2_Station mode

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

N/A



2.5 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
A	NB	DELL	E4300	N/A
B	Fixture	MASIMO	AIOS9 test jig	N/A



3 Transmitter Test Result

3.1 Maximum Output Power

3.1.1 Limit

Maximum Output Power Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
☐	- Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees ≤ 125mW [21dBm] - Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ - Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$. - Mobile or Portable Client: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐	For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐	For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$.
☐ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
LE-LAN Devices	
☐ For the 5.15-5.25 GHz band:	
☐	- For other devices: The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. - Vehicles devices: The maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
☐ For the 5.25-5.35 GHz band:	
☐	- For other devices: The maximum conducted output power shall not exceed 250 mW or 11 + 10 log 10 B, dBm, and the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz - Vehicles devices: The maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.
☐	For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log 10 B, dBm, and the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

☐ For the 5.725-5.85 GHz band:	
	Point-to-multipoint systems (P2M): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$.
	Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W.
P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi.	

3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
	Average over on/off periods with duty factor
	☐ Refer as FCC KDB 789033 D02, clause E Method SA-2 (spectral trace averaging).
	☐ Refer as FCC KDB 789033 D02, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
	Wideband RF power meter and average over on/off periods with duty factor
	☒ Refer as FCC KDB 789033 D02, clause E Method PM-G (using an RF average power meter).
☒ For conducted measurement.	
	If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$
☐ For radiated measurement.	
	Refer as FCC KDB 789033 D02 clause II A.1.F "Antenna-port Conducted versus Radiated Testing"
	Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
	Refer as FCC KDB 412172 D01 clause 2.2 for EIRP calculation.

3.1.4 Test Setup

Conducted Measurement (Power Meter)




3.1.5 Test Result of Maximum Output Power

Refer as Appendix A



3.2 Power Spectral Density

3.2.1 Limit

Peak Power Spectral Density Limit	
UNII Devices	
☒ For the 5.15-5.25 GHz band:	
☐	- Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. - Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. If $G_{TX} > 23$ dBi, then $P_{Out} = 17 - (G_{TX} - 23)$. - Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☐ For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If $G_{TX} > 6$ dBi, then $PPSD = 11 - (G_{TX} - 6)$.	
☐ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
LE-LAN Devices	
☐ For the 5.15-5.25 GHz band, the e.i.r.p. peak power spectral density (PPSD) ≤ 10 dBm/MHz.	
☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz.	
☐	e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where θ is the angle above the local horizontal plane (of the Earth) as shown below: -13 dBW/MHz for $0^\circ \leq \theta < 8^\circ$; -13 - 0.716 (θ-8) dBW/MHz for $8^\circ \leq \theta < 40^\circ$ -35.9 - 1.22 (θ-40) dBW/MHz for $40^\circ \leq \theta \leq 45^\circ$; -42 dBW/MHz for $\theta > 45^\circ$
☐ For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the peak power spectral density (PPSD) ≤ 11 dBm/MHz.	
☐ For the 5.725-5.85 GHz band:	
☐	- Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. If $G_{TX} > 6$ dBi, then $PPSD = 30 - (G_{TX} - 6)$. - Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz.
PPSD = peak power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi.	

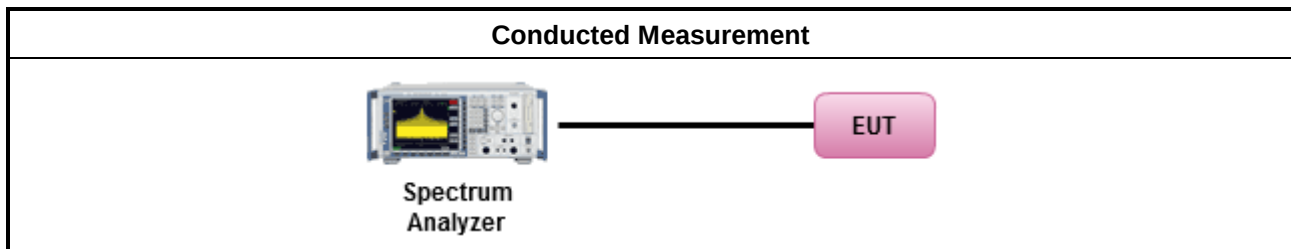
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

**3.2.3 Test Procedures**

Test Method	
Peak power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the peak power spectral density and use the peak search function on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density shall be measured using below options:	
☐	Refer as FCC KDB 789033 D02, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth
[duty cycle ≥ 98% or external video / power trigger]	
☒	Refer as FCC KDB 789033 D02, clause E Method SA-1 (spectral trace averaging).
☐	Refer as FCC KDB 789033 D02, clause E Method SA-1 Alt. (RMS detection with slow sweep speed)
duty cycle < 98% and average over on/off periods with duty factor	
☒	Refer as FCC KDB 789033 D02, clause E Method SA-2 (spectral trace averaging).
☐	Refer as FCC KDB 789033 D02, clause E Method SA-2 Alt. (RMS detection with slow sweep speed)
☒ For conducted measurement.	
If the EUT supports multiple transmit chains using options given below:	
☒	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
☐	Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits,
☐	Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.
If multiple transmit chains, EIRP PPSD calculation could be following as methods: $PPSD_{total} = PPSD_1 + PPSD_2 + \dots + PPSD_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = PPSD_{total} + DG$	
☐ For radiated measurement.	
- Refer as FCC KDB 789033 D02 clause II A.1.F "Antenna-port Conducted versus Radiated Testing" - Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz. - Refer as FCC KDB 412172 D01 clause 2.2 for EIRP calculation.	

3.2.4 Test Setup



3.2.5 Test Result of Power Spectral Density

Refer as Appendix B



3.3 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Dec. 22, 2023	Dec. 21, 2024	Conducted (TH03-CB)
Power Sensor	Anritsu	MA2411B	1726195	300MHz~40GHz	Sep. 06, 2024	Sep. 05, 2025	Conducted (TH03-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 06, 2024	Sep. 05, 2025	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-11	30MHz ~18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-12	30MHz ~18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH03-CB)
RF Cable	Woken	RG402	High Cable-13	30MHz ~18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz ~18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz ~18 GHz	Oct. 01, 2024	Sep. 30, 2025	Conducted (TH03-CB)
Switch	SPTCB	SP-SWI	SWI-03	1~18GHz	Oct. 02, 2024	Oct. 01, 2025	Conducted (TH03-CB)
Test Software	SPORTON	SENSE-15407_NII	V5.11. 23	5.15GHz-7.115GHz	N.C.R.	N.C.R.	Conducted (TH03-CB)

Note: Calibration Interval of instruments listed above is one year.
NCR means Non-Calibration required.



Average Power_Mode 1

Appendix A.1

Summary

Mode	Total Power (dBm)	Total Power (W)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	23.58	0.22803
802.11n HT20_Nss1,(MCS0)_2TX	23.35	0.21627
802.11n HT40_Nss1,(MCS0)_2TX	22.02	0.15922



Average Power_Mode 1

Appendix A.1

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	1.80	15.33	15.18	18.27	30.00
5200MHz	Pass	1.80	20.43	20.70	23.58	30.00
5240MHz	Pass	1.80	19.11	19.59	22.37	30.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	1.80	15.98	16.49	19.25	30.00
5200MHz	Pass	1.80	20.15	20.53	23.35	30.00
5240MHz	Pass	1.80	18.89	19.48	22.21	30.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	1.80	13.42	13.59	16.52	30.00
5230MHz	Pass	1.80	18.60	19.38	22.02	30.00

DG = Directional Gain; Port X = Port X output power
Inf = There's no restriction for the limit.



Average Power_Mode 2

Appendix A.2

Summary

Mode	Total Power (dBm)	Total Power (W)
5.15-5.25GHz	-	-
802.11a_Nss1,(6Mbps)_2TX	23.02	0.20045
802.11n HT20_Nss1,(MCS0)_2TX	23.35	0.21627
802.11n HT40_Nss1,(MCS0)_2TX	22.02	0.15922



Average Power_Mode 2

Appendix A.2

Result

Mode	Result	DG	Port 1	Port 2	Total Power	Power Limit
		(dBi)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	1.80	15.33	15.18	18.27	23.98
5200MHz	Pass	1.80	19.98	20.04	23.02	23.98
5240MHz	Pass	1.80	19.11	19.59	22.37	23.98
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	1.80	15.98	16.49	19.25	23.98
5200MHz	Pass	1.80	20.15	20.53	23.35	23.98
5240MHz	Pass	1.80	18.89	19.48	22.21	23.98
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	1.80	13.42	13.59	16.52	23.98
5230MHz	Pass	1.80	18.60	19.38	22.02	23.98

DG = Directional Gain; Port X = Port X output power
Inf = There's no restriction for the limit.



Summary

Mode	PD
	(dBm/RBW)
5.15-5.25GHz	-
802.11a_Nss1,(6Mbps)_2TX	11.19
802.11n HT20_Nss1,(MCS0)_2TX	10.88
802.11n HT40_Nss1,(MCS0)_2TX	6.89

RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

Result

Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	4.46	2.79	2.93	5.86	17.00
5200MHz	Pass	4.46	8.01	8.37	11.19	17.00
5240MHz	Pass	4.46	6.88	7.55	10.20	17.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	4.46	3.37	4.07	6.73	17.00
5200MHz	Pass	4.46	7.80	8.12	10.88	17.00
5240MHz	Pass	4.46	6.65	7.20	9.93	17.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	4.46	-1.95	-1.60	1.22	17.00
5230MHz	Pass	4.46	3.49	4.33	6.89	17.00

DG = Directional Gain; RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;
 PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;
 Inf = There's no restriction for the limit.

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_2TX

PSD

5180MHz

12/12/2024

CF (Hz)
5.18G

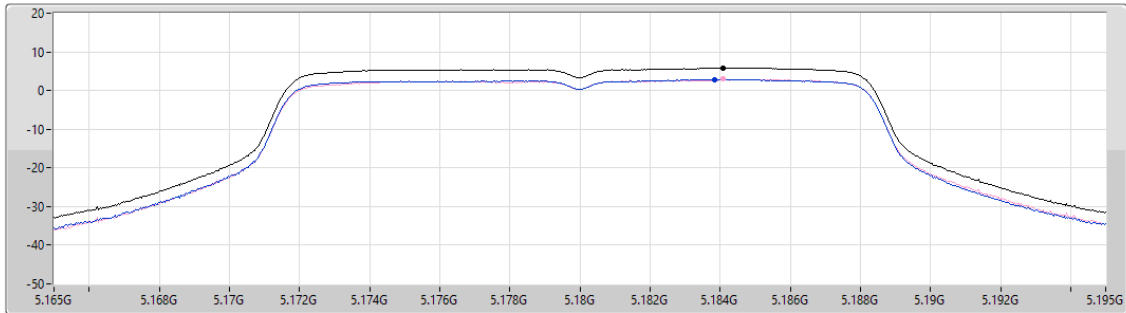
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.616

Detector Type
RMS



Sum ☒

Port 1 ☐

Port 2 ☐

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
5.86	5.86	2.79	2.93

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_2TX

PSD

5200MHz

12/12/2024

CF (Hz)
5.2G

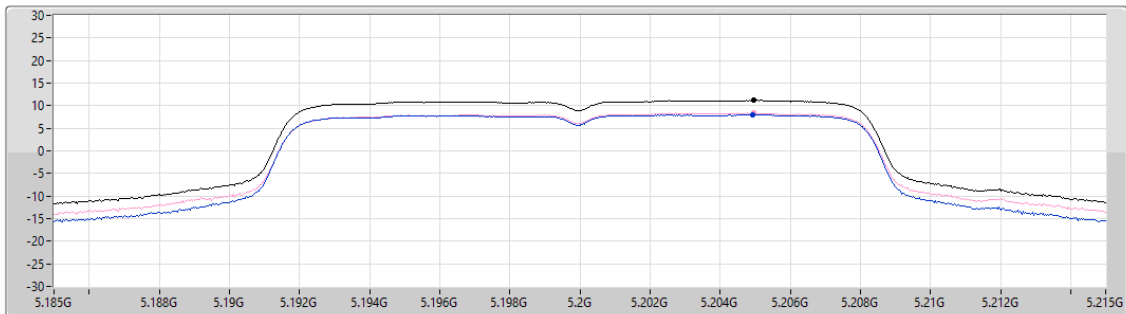
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.616

Detector Type
RMS



Sum ☒

Port 1 ☐

Port 2 ☐

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
11.19	11.19	8.01	8.37

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_2TX

PSD

5240MHz

12/12/2024

CF (Hz)
5.24G

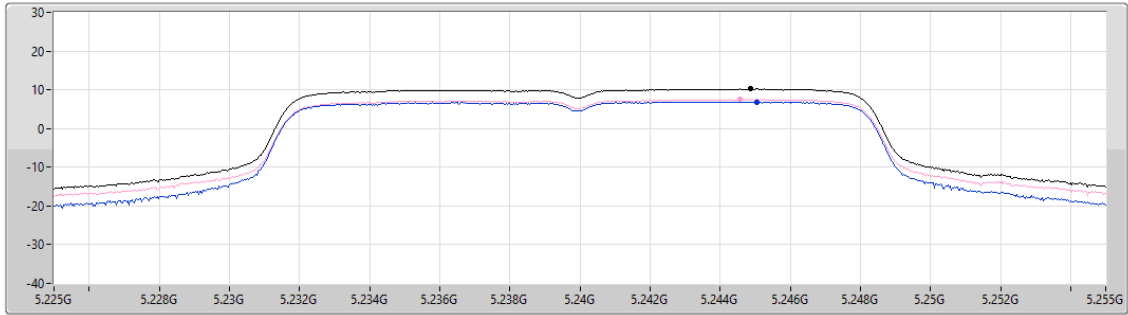
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.616

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
10.20	10.20	6.88	7.55

5.15-5.25GHz_802.11n HT20_Nss1,(MCS0)_2TX

PSD

5180MHz

12/12/2024

CF (Hz)
5.18G

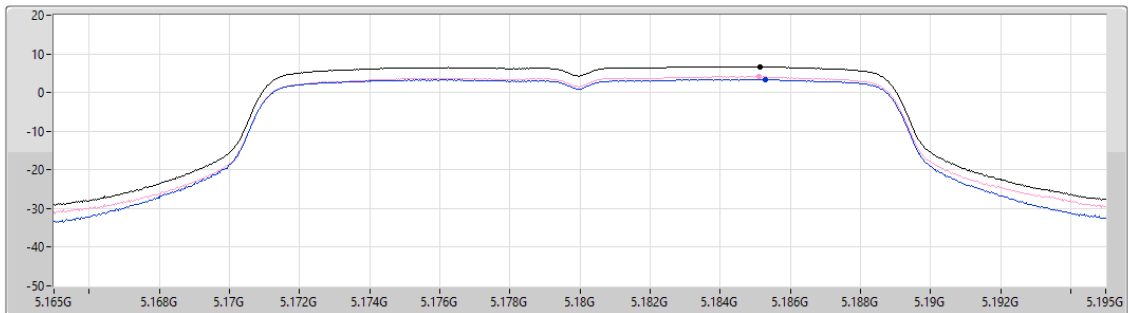
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
6.73	6.73	3.37	4.07

5.15-5.25GHz_802.11n HT20_Nss1,(MCS0)_2TX

PSD

5200MHz

12/12/2024

CF (Hz)
5.2G

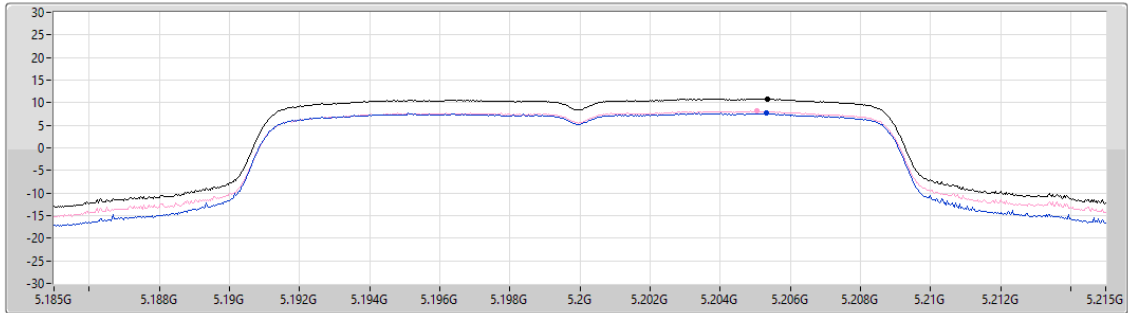
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
10.88	10.88	7.80	8.12

5.15-5.25GHz_802.11n HT20_Nss1,(MCS0)_2TX

PSD

5240MHz

12/12/2024

CF (Hz)
5.24G

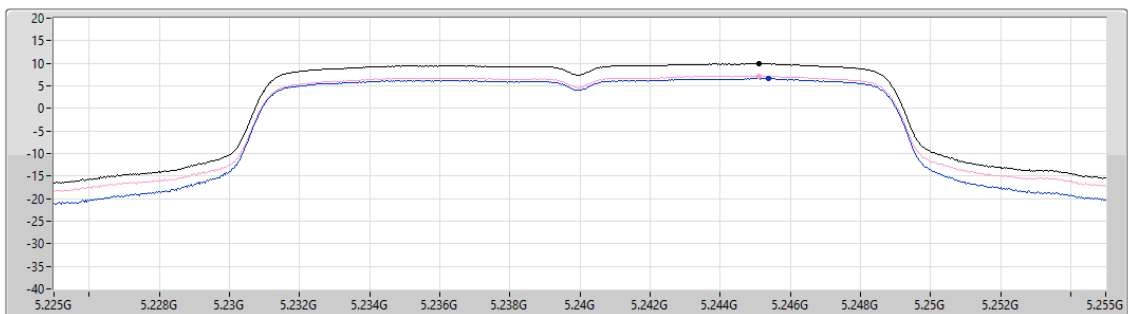
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
9.93	9.93	6.65	7.20

5.15-5.25GHz_802.11n HT40_Nss1,(MCS0)_2TX

PSD

5190MHz

12/12/2024

CF (Hz)
5.19G

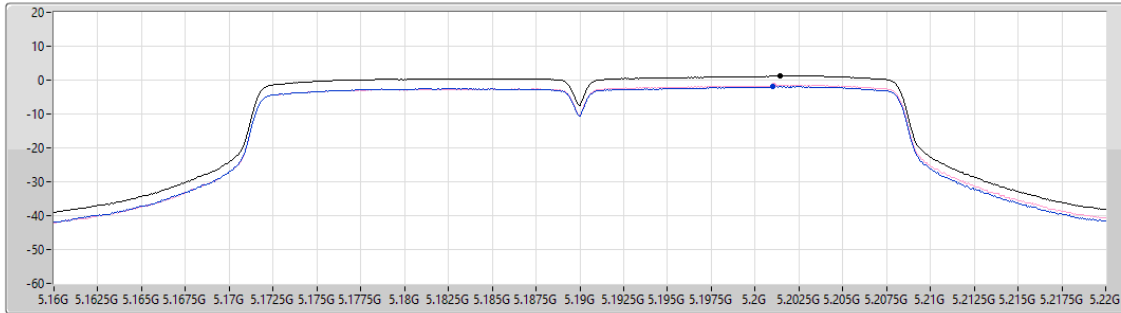
Span (Hz)
60M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum ☒

Port 1 ☐

Port 2 ☐

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
1.22	1.22	-1.95	-1.60

5.15-5.25GHz_802.11n HT40_Nss1,(MCS0)_2TX

PSD

5230MHz

12/12/2024

CF (Hz)
5.23G

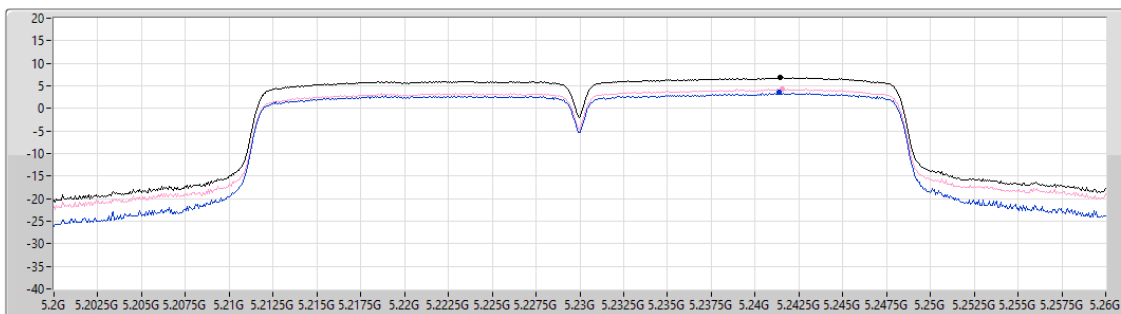
Span (Hz)
60M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum ☒

Port 1 ☐

Port 2 ☐

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
6.89	6.89	3.49	4.33



Summary

Mode	PD
	(dBm/RBW)
5.15-5.25GHz	-
802.11a_Nss1,(6Mbps)_2TX	10.66
802.11n HT20_Nss1,(MCS0)_2TX	10.88
802.11n HT40_Nss1,(MCS0)_2TX	6.89

RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;

Result

Mode	Result	DG	Port 1	Port 2	PD	PD Limit
		(dBi)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
802.11a_Nss1,(6Mbps)_2TX	-	-	-	-	-	-
5180MHz	Pass	4.46	2.79	2.93	5.86	11.00
5200MHz	Pass	4.46	7.38	7.95	10.66	11.00
5240MHz	Pass	4.46	6.88	7.55	10.20	11.00
802.11n HT20_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5180MHz	Pass	4.46	3.37	4.07	6.73	11.00
5200MHz	Pass	4.46	7.80	8.12	10.88	11.00
5240MHz	Pass	4.46	6.65	7.20	9.93	11.00
802.11n HT40_Nss1,(MCS0)_2TX	-	-	-	-	-	-
5190MHz	Pass	4.46	-1.95	-1.60	1.22	11.00
5230MHz	Pass	4.46	3.49	4.33	6.89	11.00

DG = Directional Gain; RBW = 500kHz for 5.725-5.85GHz band / 1MHz for other band;
 PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;
 Inf = There's no restriction for the limit.

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_2TX

PSD

5180MHz

12/12/2024

CF (Hz)
5.18G

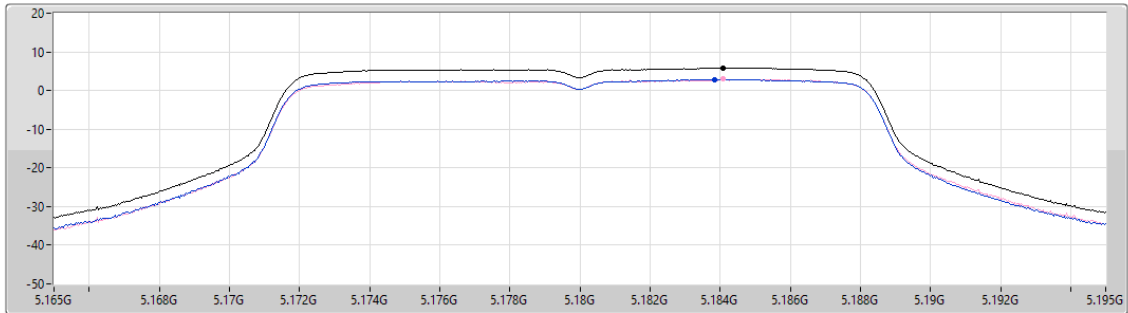
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.616

Detector Type
RMS



Sum ☒

Port 1 ☐

Port 2 ☐

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
5.86	5.86	2.79	2.93

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_2TX

PSD

5200MHz

12/12/2024

CF (Hz)
5.2G

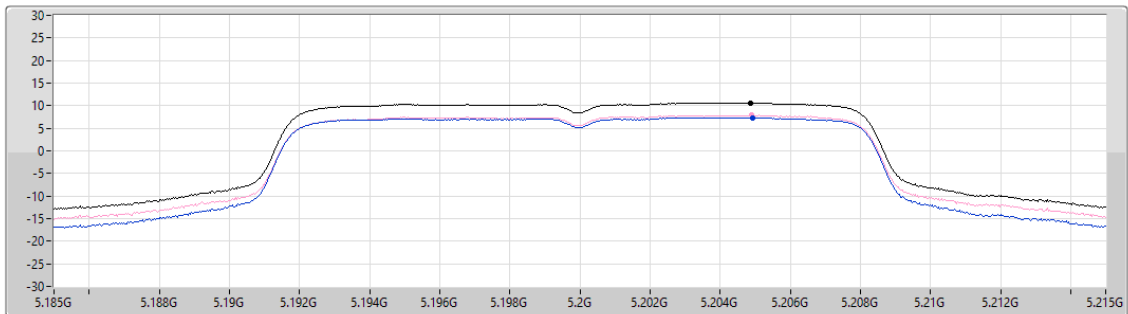
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.616

Detector Type
RMS



Sum ☒

Port 1 ☐

Port 2 ☐

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
10.66	10.66	7.38	7.95

5.15-5.25GHz_802.11a_Nss1,(6Mbps)_2TX

PSD

5240MHz

12/12/2024

CF (Hz)
5.24G

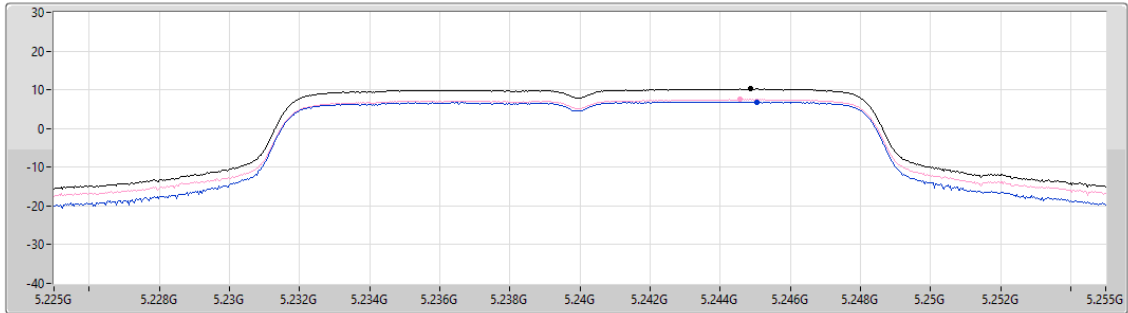
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.616

Detector Type
RMS



Sum (dBm/Hz)	PD (dBm/Hz)	Port 1 (dBm/Hz)	Port 2 (dBm/Hz)
10.20	10.20	6.88	7.55

Sum ☒

Port 1 ☒

Port 2 ☒

5.15-5.25GHz_802.11n HT20_Nss1,(MCS0)_2TX

PSD

5180MHz

12/12/2024

CF (Hz)
5.18G

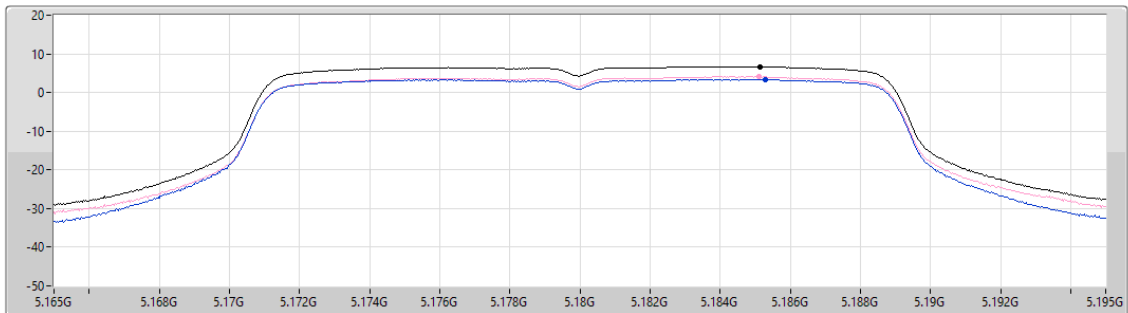
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum (dBm/Hz)	PD (dBm/Hz)	Port 1 (dBm/Hz)	Port 2 (dBm/Hz)
6.73	6.73	3.37	4.07

Sum ☒

Port 1 ☒

Port 2 ☒

5.15-5.25GHz_802.11n HT20_Nss1,(MCS0)_2TX

PSD

5200MHz

12/12/2024

CF (Hz)
5.2G

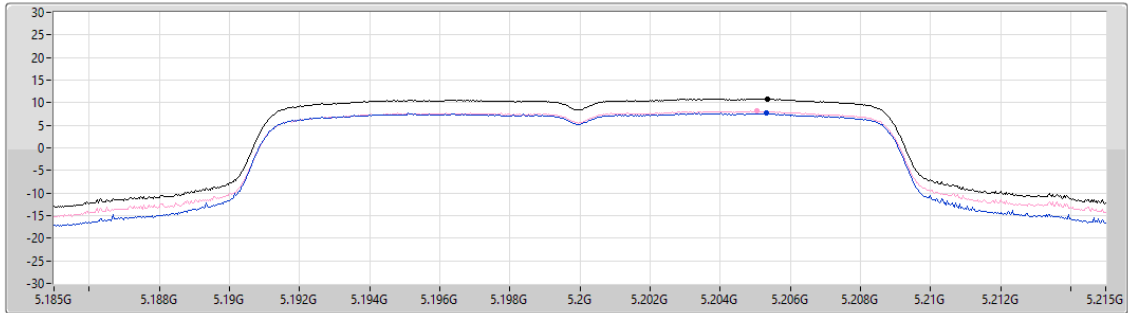
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
10.88	10.88	7.80	8.12

5.15-5.25GHz_802.11n HT20_Nss1,(MCS0)_2TX

PSD

5240MHz

12/12/2024

CF (Hz)
5.24G

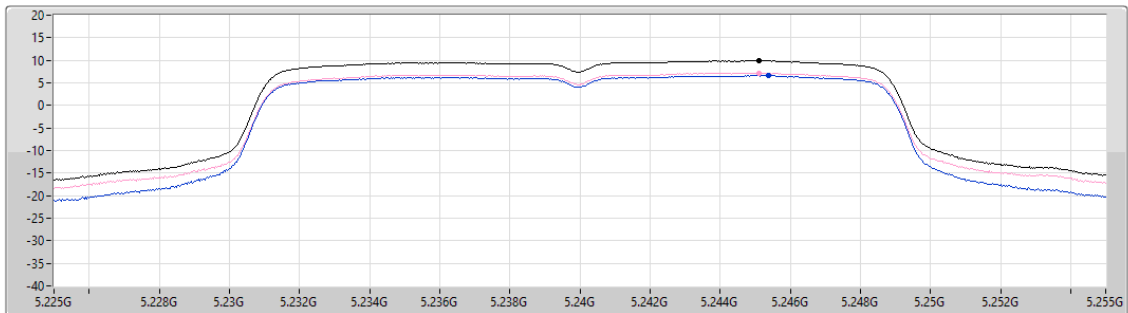
Span (Hz)
30M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
9.93	9.93	6.65	7.20

5.15-5.25GHz_802.11n HT40_Nss1,(MCS0)_2TX

PSD

5190MHz

12/12/2024

CF (Hz)
5.19G

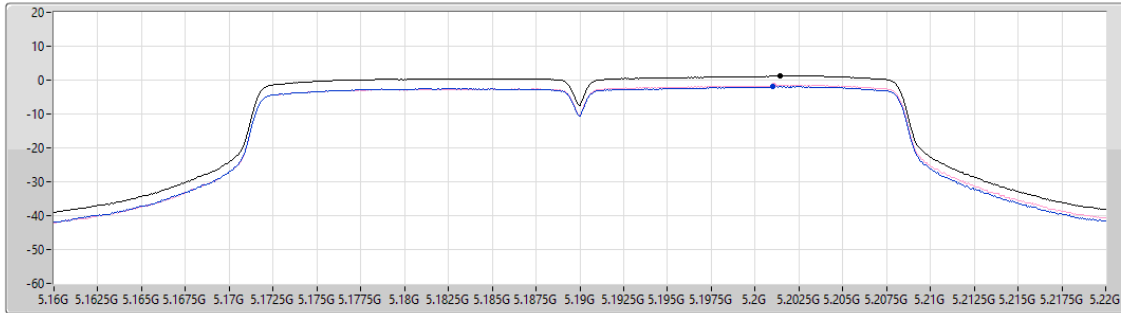
Span (Hz)
60M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
1.22	1.22	-1.95	-1.60

5.15-5.25GHz_802.11n HT40_Nss1,(MCS0)_2TX

PSD

5230MHz

12/12/2024

CF (Hz)
5.23G

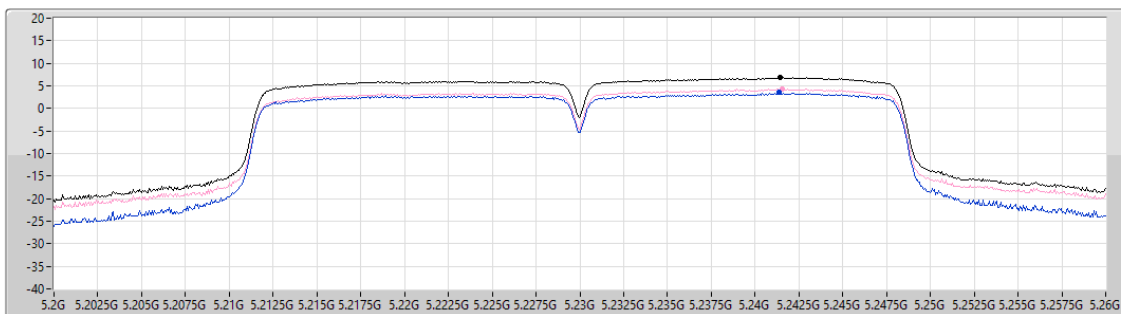
Span (Hz)
60M

RBW (Hz)
1M

VBW (Hz)
3M

Sweep Time (s)
16.621

Detector Type
RMS



Sum 

Port 1 

Port 2 

Sum	PD	Port 1	Port 2
(dBm/Hz)	(dBm/Hz)	(dBm/Hz)	(dBm/Hz)
6.89	6.89	3.49	4.33