Testing Laboratory 3787

RADIO EXPOSURE 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 Part 2.1091

The product was received on Oct. 24, 2024, and testing was started from Nov. 15, 2024 and completed on Jul. 15, 2025. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this 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.)

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FA4O2328	01	Initial issue of report	Mar. 18, 2025
FA4O2328	02	1. Updating the EUT version to “R01” from “R0” 2. Changing the exterior of Set 2, Ant. 1 3. Adding the second source of eMMC and defining it as EUT 2 4. Recalculating the RF exposure 5. Updating the Photographs of EUT	Aug. 13, 2025

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	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/manufacturer 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:
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.

Reviewed by: Sam Chen

Report Producer: Sophia Shiung

1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250	5180-5240	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
6GHz WLAN	5925-7125	5955-7115	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / π/4-DQPSK / 8DPSK) LE: GFSK

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	-	-	1.4	-	-	-	0.9	-	-	-	0.5	-
5	-	-	2.1	-	-	-	1	-	-	-	1.1	-

<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	-	-	1.4	-	-	-	0.6	-	-	-	0.8	-
5	-	-	1.4	-	-	-	0.4	-	-	-	1	-

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

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

gj,k =$(Nss1(g1,1) + Nss1(g1,2))^2$

DG = 10 log[$(Nss1(g1,1) + Nss1(g1,2))^2 / N_{ANT}$] => 10 log[$(10^{G1/20} + 10^{G2/20})^2 / N_{ANT}$]

Where ;

2.4G G1 = 2 dBi; G2 = 1.8 dBi; DG = 4.91 dBi
5G G1 = 1 dBi; G2 = 0.8 dBi; DG = 3.91 dBi
6G G1 = 2.6 dBi; G2 = 2 dBi; DG = 5.32 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.

1.3 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.

1.4 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 1: From above EUTs, EUT 1 was selected to test.
Note 2: The above information was declared by manufacturer.

1.5 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.

1.6 Accessories

N/A

1.7 Testing Location

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.	

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-3.0	614	1.63	*(100)	<6
3.0-30	1842/f	4.89/f	*(900/f²)	<6
30-300	61.4	0.163	1.0	<6
300-1500	-	-	f/300	<6
1500-100,000	-	-	5	<6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f²)	<30
30-300	27.5	0.073	0.2	<30
300-1500	-	-	f/1500	<30
1500-100,000	-	-	1.0	<30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm^2)	Limit (mW/cm^2)	S/Limit Ratio
2.4G;G1D	2.00	26.77	28.77	0.50	29.27	20	0.16816	1.00000	0.16816
5.2G;D1D	1.10	23.58	24.68	0.50	25.18	20	0.06557	1.00000	0.06557
6.2G;D1D	2.80	8.99	11.79	0.50	12.29	20	0.00337	1.00000	0.00337
6.4G;D1D	2.80	8.93	11.73	0.50	12.23	20	0.00332	1.00000	0.00332
6.7G;D1D	2.80	8.96	11.76	0.50	12.26	20	0.00335	1.00000	0.00335
7.0G;D1D	2.80	8.79	11.59	0.50	12.09	20	0.00322	1.00000	0.00322
2.4G;BT-BR	1.40	6.12	7.52	0.50	8.02	20	0.00126	1.00000	0.00126
2.4G;BT-LE	1.40	5.30	6.70	0.50	7.20	20	0.00104	1.00000	0.00104

Simultaneous Transmission Analysis Mode:

Mode 1: WLAN 2.4GHz + WLAN 5GHz + Bluetooth

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm^2)	Limit (mW/cm^2)	S/Limit Ratio
2.4G;G1D	2.00	26.77	28.77	0.50	29.27	20	0.16816	1.00000	0.16816
5.2G;D1D	1.10	23.58	24.68	0.50	25.18	20	0.06557	1.00000	0.06557
2.4G;BT-BR	1.40	6.12	7.52	0.50	8.02	20	0.00126	1.00000	0.00126
Sum S/Limit Ratio	0.23499								
Ratio Limit	1								

Mode 2: WLAN 6GHz + WLAN 5GHz + Bluetooth

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm^2)	Limit (mW/cm^2)	S/Limit Ratio
5.2G;D1D	1.10	23.58	24.68	0.50	25.18	20	0.06557	1.00000	0.06557
6.2G;D1D	2.80	8.99	11.79	0.50	12.29	20	0.00337	1.00000	0.00337
2.4G;BT-BR	1.40	6.12	7.52	0.50	8.02	20	0.00126	1.00000	0.00126
Sum S/Limit Ratio	0.0702								
Ratio Limit	1								

Note: The above antenna gain was declared by manufacturer.