



# RADIO EXPOSURE TEST REPORT

**FCC ID** : HEDOAP101E

**Equipment** : Outdoor Access Point

**Brand Name** : Edgecore

**Model Name** : OAP101-6EXYYYZ, OAP101e-6EXYYYZ  
(Please refer to section 1.3 for detail information.)

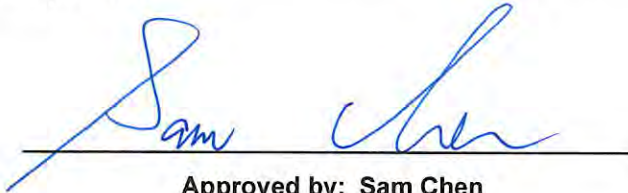
**Applicant** : Accton Technology Corporation  
No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.

**Manufacturer** : Accton Technology Corporation  
No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.

**Standard** : 47 CFR Part 2.1091

The product was received on Jun. 26, 2023, and testing was started from Jul. 11, 2023 and completed on Oct. 13, 2023. 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**  
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**Photographs of EUT v01**





## 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/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:**

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: Vicky Huang**



# 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 5250-5350 5470-5725 5725-5850	5180-5250 5250-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK



## 1.2 Antenna Information

For EUT 1:

Ant.	Port					Brand	Model Name	Antenna Type	Connector	Remark	Gain (dBi)
	Bluetooth	2.4GHz	5GHz	6GHz	GPS						
1	1	-	-	-	-	Accton	KG458-160Y17U7X	PCB	I-PEX	Internal Ant.	Note1
2	-	1	-	-	-	Accton	KG458-150L17U7X	PCB	I-PEX	Internal Ant.	
3	-	2	-	-	-	Accton	KG458-250F17U7X	PCB	I-PEX	Internal Ant.	
4	-	-	1	-	-	Accton	KG459-200G17U7X	PCB	I-PEX	Internal Ant.	
5	-	-	2	-	-	Accton	KG459-405W17U7X	PCB	I-PEX	Internal Ant.	
6	-	-	-	1	-	Accton	KG460-335H17U7X	PCB	I-PEX	Internal Ant.	
7	-	-	-	2	-	Accton	KG461-235A17U7X	PCB	I-PEX	Internal Ant.	
8	-	-	-	-	1	Master Wave	907X01077X2	Patch	I-PEX	Internal Ant.	2.96

Note1:

Ant.	Gain (dBi)			
	Bluetooth	2.4GHz	5GHz	6GHz
1	5.91	-	-	-
2	-	5.67	-	-
3	-	5.99	-	-
4	-	-	6.91	-
5	-	-	6.29	-
6	-	-	-	6.96
7	-	-	-	6.96

Note 2: 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	$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{ANT}} \left[ \sum_{k=1}^{N_{ANT}} S_{j,k} \right]^2}{N_{ANT}} \right]$
BF	$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{ANT}} \left[ \sum_{k=1}^{N_{ANT}} S_{j,k} \right]^2}{N_{ANT}} \right]$	$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{ANT}} \left[ \sum_{k=1}^{N_{ANT}} S_{j,k} \right]^2}{N_{ANT}} \right]$

Ex.

Directional Gain (NSS1) formula :

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

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

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

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

Where ;

$$2.4G \ G1= 5.67 \text{ dBi} ; G2= 5.99 \text{ dBi} ; DG= 8.84\text{dBi}$$

$$5G \ G1= 6.91 \text{ dBi} ; G2= 6.29 \text{ dBi} ; DG= 9.62\text{dBi}$$

$$6G \ G1= 6.96 \text{ dBi} ; G2= 6.96 \text{ dBi} ; DG= 9.97\text{dBi}$$



**For EUT 2:**

Ant.	Port					Brand	Model Name	Antenna Type	Connector	Remark	Gain (dBi)
	Bluetooth	2.4GHz	5GHz	6GHz	GPS						
1	1	-	-	-	-	Accton	KG458-160Y17U7X	PCB	I-PEX	Internal Ant.	Note3
2	-	1	-	-	-	Accton	KG458-150L17U7X	PCB	I-PEX	Internal Ant.	
3	-	2	-	-	-	Accton	KG458-250F17U7X	PCB	I-PEX	Internal Ant.	
4	-	-	1	-	-	Master Wave	98110UNXX001	Omni Dipole	I-PEX	External Ant.	
5	-	-	2	-	-	Master Wave	98110UNXX001	Omni Dipole	I-PEX	External Ant.	
6	-	-	-	1	-	Master Wave	98110VNXX001	Omni Dipole	I-PEX	External Ant.	
7	-	-	-	2	-	Master Wave	98110VNXX001	Omni Dipole	I-PEX	External Ant.	
8	-	-	-	-	1	Master Wave	907X01077X2	Patch	I-PEX	Internal Ant.	

Note3:

Ant.	Gain (dBi)				Cable Loss (dB)				Net Gain (dBi)			
	Bluetooth	2.4GHz	5GHz	6GHz	Bluetooth	2.4GHz	5GHz	6GHz	Bluetooth	2.4GHz	5GHz	6GHz
1	5.91	-	-	-	-	-	-	-	-	-	-	-
2	-	5.67	-	-	-	-	-	-	-	-	-	-
3	-	5.99	-	-	-	-	-	-	-	-	-	-
4	-	-	6.54	-	-	-	1.1	-	-	-	5.44	-
5	-	-	6.54	-	-	-	2.13	-	-	-	4.41	-
6	-	-	-	6.48	-	-	-	1.74	-	-	-	4.81
7	-	-	-	6.48	-	-	-	1.5	-	-	-	5.05

Note4: 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	$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{ANT}} \left( \sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right]$
BF	$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{ANT}} \left( \sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right]$	$DirectionalGain = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{ANT}} \left( \sum_{k=1}^{N_{ANT}} g_{j,k} \right)^2}{N_{ANT}} \right]$

Ex.

Directional Gain (NSS1) formula :

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

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

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

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

Where ;

2.4G  $G1 = 5.67$  dBi ;  $G2 = 5.99$  dBi ;  $DG = 8.84$  dBi

5G  $G1 = 5.44$  dBi ;  $G2 = 4.41$  dBi ;  $DG = 7.95$  dBi

6G  $G1 = 4.81$  dBi ;  $G2 = 5.05$  dBi ;  $DG = 7.94$  dBi



Note5: The above information was declared by manufacturer.

Note6: The WLAN 6GHz function is not enabled for this application.

Note7: **For WLAN 2.4GHz function:**

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

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

Port 1 and Port 2 could transmit/receive simultaneously.

**For WLAN 5GHz function:**

**For IEEE 802.11a/n/ac/ax mode (2TX/2RX):**

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

Port 1 and Port 2 could transmit/receive simultaneously

**For 6GHz function:**

**For IEEE 802.11ax mode (2TX/2RX):**

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

Port 1 and Port 2 could transmit/receive simultaneously

**For Bluetooth function:**

**For Bluetooth mode (1TX/1RX):**

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

**For GPS function:**

**For GPS mode (1TX/1RX):**

Only Port 1 can be used as receiving antenna.

### 1.3 Table for Multiple Listing

The model names which are identical to each other in all aspects except for the following table:

EUT	Model Name	GPS	BT	2.4GHz	5GHz
1	OAP101-6EXYYYYZ (Note 1)	V	V	V	V (Internal Antenna)
2	OAP101e-6EXYYYYZ (Note 1)	V	V	V	V (External Antenna)

Note 1: The difference of "XYYYYZ" would be marketing strategy X can be symbol "(" or "blank" Y can be "A~Z, a~z, 1~9 or blank and -"Z can be symbol ")" or "blank"

Note 2: The above information was declared by manufacturer.

Note 3: From the above models, model: OAP101-6E(EUT 1) and OAP101e-6E(EUT 2) was selected as representative model for the test and its data was recorded in this report.

### 1.4 Accessories

Accessories
DC Jack*1
Sealing Collar*3





## 1.5 Applicable Standards

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

- ♦ 47 CFR Part 2.1091
- ♦ KDB 447498 D04 Interim General RF Exposure Guidance v01

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

- ♦ 47 CFR Part 1.1307
- ♦ 47 CFR Part 1.1310

## 1.6 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/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	*(100)	<6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	<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/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	<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 59 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

**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 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= Pth.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance R between the person and the antenna / radiating structure, where  $R > \lambda / 2 \pi$ .

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R <sup>2</sup> .
1.34-30	3,450 R <sup>2</sup> /f <sup>2</sup> .
30-300	3.83 R <sup>2</sup> .
300-1,500	0.0128 R <sup>2</sup> f.
1,500-100,000	19.2R <sup>2</sup> .

Note: R is in meters, f is in MHz.



## 2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

EUT 1:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm <sup>2</sup> )	S Limit (mW/cm <sup>2</sup> )	Option	TL EIRP (dBm)	TL Ratio
2.4G;G1D	5.99	29.79	35.78	0.21	35.99	59	0.09080	1.00000	C	40.398	0.3624
5.2G;D1D	6.91	25.97	32.88	0.50	33.38	59	0.04978	1.00000	C	40.398	0.1987
5.3G;D1D	6.91	23.05	29.96	0.03	29.99	59	0.02281	1.00000	C	40.398	0.0910
5.6G;D1D	9.62	20.29	29.91	0.08	29.99	59	0.02281	1.00000	C	40.398	0.0910
5.8G;D1D	9.62	26.36	35.98	0.01	35.99	59	0.09080	1.00000	C	40.398	0.3624
2.4G;BT-LE	5.91	3.13	9.04	0.50	9.54	59	0.00021	1.00000	C	40.398	0.0008

EUT 2:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm <sup>2</sup> )	S Limit (mW/cm <sup>2</sup> )	Option	TL EIRP (dBm)	TL Ratio
2.4G;G1D	5.99	29.79	35.78	0.21	35.99	59	0.09080	1.00000	C	40.398	0.3624
5.2G;D1D	5.44	21.67	27.11	0.50	27.61	59	0.01319	1.00000	C	40.398	0.0526
5.3G;D1D	7.95	22.01	29.96	0.03	29.99	59	0.02281	1.00000	C	40.398	0.0910
5.6G;D1D	7.95	22.02	29.97	0.02	29.99	59	0.02281	1.00000	C	40.398	0.0910
5.8G;D1D	7.95	27.79	35.74	0.25	35.99	59	0.09080	1.00000	C	40.398	0.3624
2.4G;BT-LE	5.91	3.13	9.04	0.50	9.54	59	0.00021	1.00000	C	40.398	0.0008



**Simultaneous Transmission Analysis Mode:**

**Mode 1: EUT 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Option	TL EIRP (dBm)	TL Ratio
5.8G:D1D	9.62	26.36	35.98	0.01	35.99	59	0.09080	1.00000	C	40.398	0.3624
2.4G:BT-LE	5.91	3.13	9.04	0.50	9.54	59	0.00021	1.00000	C	40.398	0.0008
2.4G:G1D	5.99	29.79	35.78	0.21	35.99	59	0.09080	1.00000	C	40.398	0.3624
Sum TL Ratio_C	0.7256										
Ratio Limit	1										

**Mode 2: EUT 2-WLAN 2.4GHz+WLAN 5GHz+Bluetooth**

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Option	TL EIRP (dBm)	TL Ratio
5.8G:D1D	7.95	27.79	35.74	0.25	35.99	59	0.09080	1.00000	C	40.398	0.3624
2.4G:BT-LE	5.91	3.13	9.04	0.50	9.54	59	0.00021	1.00000	C	40.398	0.0008
2.4G:G1D	5.99	29.79	35.78	0.21	35.99	59	0.09080	1.00000	C	40.398	0.3624
Sum TL Ratio_C	0.7256										
Ratio Limit	1										

Note: The above antenna gain was declared by manufacturer.

—————THE END—————