

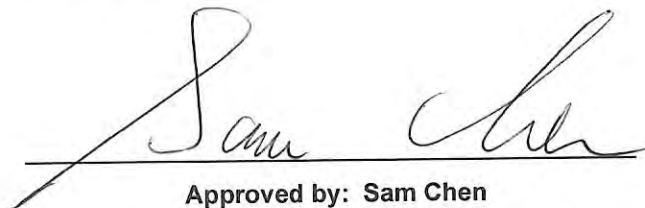


RADIO EXPOSURE TEST REPORT

FCC ID : Z3WAIR4981
Equipment : AT&T ALL Fi Booster
Brand Name : Airties
Model Name : Air4981-41
Applicant : AirTies Wireless Networks
Sehit Mehmet Mikdat Uluunlu Sokagi No:23
Esentepe, Sisli İstanbul, 34394 Turkey
Manufacturer : AirTies Wireless Networks
Sehit Mehmet Mikdat Uluunlu Sokagi No:23
Esentepe, Sisli İstanbul, 34394 Turkey
Standard : 47 CFR Part 2.1091

The product was received on Jul. 21, 2022, and testing was started from Jul. 26, 2022 and completed on Sep. 19, 2022. 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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Summary of Test Result

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

Declaration of Conformity:

1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to report "Measurement Uncertainty".

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: **Sam Chen**

Report Producer: **Sandy Chuang**



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: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 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) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)



1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	2.4GHz	5GHz	6GHz					
1	1	1	-	Galtronics	A00	Off-Board Internal Dipole	I-PEX MHF (u.FL)	Note 1
2	2	2	-	Galtronics	A11	Off-Board Internal Dipole	I-PEX MHF (u.FL)	
3	-	-	1	Galtronics	A0X	Off-Board Internal Dipole	I-PEX MHF (u.FL)	
4	-	-	2	Galtronics	A1X	Off-Board Internal Dipole	I-PEX MHF (u.FL)	
5	-	-	3	Galtronics	A2X	Off-Board Internal Dipole	I-PEX MHF (u.FL)	
6	-	-	4	Galtronics	A3X	Off-Board Internal Dipole	I-PEX MHF (u.FL)	

Note 1:

Ant.	Antenna Gain (dBi)								
	WLAN 2.4GHz	WLAN 5GHz				WLAN 6GHz			
		UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 5	UNII 6	UNII 7	UNII 8
1	5.41	5.06	4.26	5.01	4.76	-	-	-	-
2	2.96	2.91	3.33	3.97	3.8	-	-	-	-
3	-	-	-	-	-	4.06	3.64	4.3	3.51
4	-	-	-	-	-	1.65	1.44	2.31	2.08
5	-	-	-	-	-	2.58	1.31	2.03	2.7
6	-	-	-	-	-	2.51	2.82	3.53	3.79

	Directional Gain (dBi)				
	WLAN 2.4GHz	WLAN 5GHz			
		UNII 1	UNII 2A	UNII 2C	UNII 3
2T1S	5.46	5.11	4.47	5.29	4.79
2T2S	5.41	5.06	4.26	5.01	4.76



	Directional Gain (dBi)			
	WLAN 6GHz			
	UNII 5	UNII 6	UNII 7	UNII 8
4T1S	4.31	3.97	4.33	3.94
4T2S	4.06	3.64	4.30	3.79
4T4S	4.06	3.64	4.30	3.79

Note 2: The EUT has six antennas.

Note 3: The above information (excepting antenna gain) was declared by manufacturer.

Note 4: Maximum Directional Gain following KDB662911 D03.

Note 5: The antenna 3~6 were not enabled, because the EUT doesn't enable the 6GHz band at this time.

For 2.4GHz:

For IEEE 802.11b/g/n/VHT/ax mode (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 UNII 1~3:

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

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

Port 1 and Port 2 could transmit/receive simultaneously.



1.3 Table for EUT supports function

Function	Supports type	Support Band
AP Router	Master	2.4GHz / 5GHz
Mesh	Master	5GHz

1.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	AT&T (mfg. by DELTA)	EPS24R0-16	INPUT: 120V~0.725A Max 60Hz Output: 12V, 2.0A 24W

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 (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) 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 ²)	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/f ²)	<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 ²)	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/f ²)	<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:

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

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 ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .

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



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	5.41	26.04	31.45	0.50	31.95	1.56675	20	0.31170	1.00000
5.2G;D1D	5.11	27.32	32.43	0.50	32.93	1.96336	20	0.39060	1.00000
5.3G;D1D	4.47	23.95	28.42	0.50	28.92	0.77983	20	0.15514	1.00000
5.6G;D1D	5.29	23.94	29.23	0.50	29.73	0.93972	20	0.18695	1.00000
5.8G;D1D	4.79	29.22	34.01	0.50	34.51	2.82488	20	0.56199	1.00000

MPE Exemption Option B						
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
2437	0.2	31.95	29.80	0.955	3.060	Complies
5785		34.51	32.36	1.722	3.060	Complies

Simultaneous Transmission Analysis Mode:

WLAN 2.4GHz+WLAN 5GHz

Simultaneous Transmissions Option B							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
2437	0.2	31.95	29.80	0.955	3.060	0.87	<= 1
5785		34.51	32.36	1.722	3.060		

—————THE END—————