



RADIO EXPOSURE TEST REPORT

FCC ID : RAXWN8711

Equipment : Wireless LAN Network Module

Brand Name : Arcadyan

Model Name : WN8711BTAAC-YA

Applicant : Arcadyan Technology Corporation
No.8, Sec.2, Guangfu Rd.,Hsinchu, 30071 Taiwan

Manufacturer (1) : Arcadyan Technology Corporation
No.8, Sec.2, Guangfu Rd.,Hsinchu, 30071 Taiwan

Manufacturer (2) : ARCADYAN TECHNOLOGY (VIETNAM) CO.,LTD
Land Plot No. D4-5-6, Thang Long Vinh Phuc Industrial Park,
Thien Ke Commune, Binh Xuyen District, Vinh Phuc Province
Vietnam

Standard : 47 CFR Part 2.1091

The product was received on Apr. 19, 2022, and testing was started from Apr. 22, 2022 and completed on Jun. 15, 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 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

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Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 EUT General Information	5
1.2 Antenna Information	6
1.3 Table for EUT Supports Function.....	7
1.4 Table for DDR Detail Information	7
1.5 Table for EUT Information	7
1.6 Table for Permissive Change	7
1.7 Accessories	8
1.8 Applicable Standards	8
1.9 Testing Location	8
2 Maximum Permissible Exposure	9
2.1 Limit of Maximum Permissible Exposure	9
2.2 MPE Calculation Method.....	9
2.3 MPE Exemption.....	10
2.4 Calculated Result and Limit.....	11

Appendix A. Photographs of EUT



History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A1_1 Ver1.1

Page Number : 3 of 12
Issued Date : Aug. 26, 2024
Report Version : 01



Summary of Test Result

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

Note: Reference to Sporton Project No.: 770523-13

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. This is a reproduced test report from test report number FA770523-13.
This test report is intended for the applicant's internal control procedure and cannot be used for FCC equipment authorization.

Reviewed by: Sam Chen

Report Producer: Muse Chan



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)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: GFSK

Operating frequency of CPU	1GHz
Rating	3.7V, 4.21W



1.2 Antenna Information

Ant.	Brand	Model Name	Type	Connector	Gain (dBi)		Cable Length (mm)
					2.4GHz	5GHz	
1	ACON	AEMEE-10000	Dipole	Reversed-SMA	3.24	4.54	Note 1
2	WNC	YSB2022	PIFA	I-PEX	3.1	4.4	-

Note 1:

Dipole Cable	Brand	Model Name	Cable Length (mm)	Cable Loss (dB)		True Gain (dBi)	
				2.4GHz / BT	5GHz	2.4GHz / BT	5GHz
1	ACON	AEC8P-1000001 (Black)	30	0.08	0.12	3.16	4.42
2	ACON	AEC8P-1000003 (Black)	50	0.13	0.19	3.11	4.35
3	ACON	AEC8P-1000005 (Black)	70	0.19	0.27	3.05	4.27
4	ACON	AEC8P-1000007 (Black)	90	0.24	0.35	3.00	4.19
5	ACON	AEC8P-1000009 (Black)	120	0.32	0.46	2.92	4.08
6	ACON	AEC8P-1000011 (Black)	160	0.43	0.62	2.81	3.92
7	ACON	AEC8P-1000013 (Black)	200	0.54	0.77	2.70	3.77
8	ACON	AEC8P-1000015 (Black)	240	0.64	0.93	2.60	3.61
9	ACON	AEC8P-1000017 (Black)	280	0.75	1.08	2.49	3.46
10	ACON	AEC8P-1000019 (Black)	320	0.86	1.24	2.38	3.30
11	ACON	AEC8P-1000021 (Black)	360	0.96	1.39	2.28	3.15
12	ACON	AEC8P-1000023 (Black)	400	1.07	1.54	2.17	3.00
13	ACON	AEC8P-1000025 (Black)	450	1.21	1.74	2.03	2.80
14	ACON	AEC8P-1000027 (Black)	500	1.34	1.93	1.90	2.61

Note 2: Dipole Antenna collocate with 14 set cables selling, only the highest gain antenna "cable 1" was tested and recorded in the report.

Note 3: PIFA Antenna is only for EUT 2 use.

Note 4: The above information was declared by manufacturer.

Note 5: The EUT has one antenna.

For WLAN 2.4GHz Function

IEEE 802.11b/g/n (1TX/1RX):

Port 1 can be used as transmitting/receiving antenna.

Port 1 could transmit/receive simultaneously.

For WLAN 5GHz Function

IEEE 802.11a/n/ac (1TX/1RX):

Port 1 can be used as transmitting/receiving antenna.

Port 1 could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

Port 1 can be used as transmitting/receiving antenna.

Port 1 could transmit/receive simultaneously.



1.3 Table for EUT Supports Function

Function	Supports type
AP	Master
Slave	Slave without radar detection

Note: The above information was declared by manufacturer.

1.4 Table for DDR Detail Information

Items		DDR
Source		
Main	Brand	SAMSUNG
	Model	K4B2G1646F-BYMA
	Capacity	256MB
Second	Brand	WINBOND
	Model	W632GU6NB-11
	Capacity	256MB

Note: The above information was declared by manufacturer.

1.5 Table for EUT Information

EUT	DDR	Equipped Antenna
1	Main	Dipole
2	Second	Dipole, PIFA

Note: The EUT 1 was selected to perform for all the tests.

1.6 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA770523-13

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

Modifications	Performance Checking
- Adding second source DDR (Brand name: WINBOND / Model name: W632GU6NB-11). - Add a new type PIFA antenna for EUT 2. - Adding Manufacturer (Company name: ARCADYAN TECHNOLOGY (VIETNAM) CO.,LTD / Company address: Land Plot No. D4-5-6, Thang Long Vinh Phuc Industrial Park, Thien Ke Commune, Binh Xuyen District, Vinh Phuc Province Vietnam).	After evaluating, it does not affect the test.

Note: All test results are based on original test report.



1.7 Accessories

N/A

1.8 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

1.9 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 ISCED.



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:

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

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, <= P_{th}.

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

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	$19.2 R^2$.
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;G1D	3.16	23.56	26.72	0.50	27.22	0.52723	20	0.10489	1.00000
5.2G;D1D	4.42	22.57	26.99	0.50	27.49	0.56105	20	0.11162	1.00000
5.3G;D1D	4.42	21.00	25.42	0.50	25.92	0.39084	20	0.07776	1.00000
5.6G;D1D	4.42	21.25	25.67	0.50	26.17	0.41400	20	0.08236	1.00000
5.8G;D1D	4.42	23.62	28.04	0.50	28.54	0.71450	20	0.14215	1.00000
2.4G;BT-EDR	3.16	4.71	7.87	0.50	8.37	0.00687	20	0.00137	1.00000
2.4G;BT-LE	3.16	2.80	5.96	0.50	6.46	0.00443	20	0.00088	1.00000

Test Mode 1: WLAN 2.4GHz + Bluetooth

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	27.22	25.07	0.321	3.060	Complies
2402		8.37	6.22	0.004	3.060	Complies

Test Mode 2: WLAN 5GHz + Bluetooth

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
5745	0.2	28.54	26.39	0.436	3.060	Complies
2402		8.37	6.22	0.004	3.060	Complies

**Simultaneous Transmission Analysis Mode:****Test Mode 1: WLAN 2.4GHz + Bluetooth**

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	27.22	25.07	0.321	3.060	0.11	<= 1
2402		8.37	6.22	0.004	3.060		

Test Mode 2: WLAN 5GHz + Bluetooth

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
5745	0.2	28.54	26.39	0.436	3.060	0.14	<= 1
2402		8.37	6.22	0.004	3.060		

————THE END————