Testing Laboratory 3787

RADIO EXPOSURE TEST REPORT

FCC ID	:	TLZ-AM510
Equipment	:	IEEE 802.11 1X1 a/b/g/n Wireless LAN + Bluetooth 5.1 Combo 12 x 12 LGA Module
Brand Name	:	AzureWave
Model Name	:	AW-AM510 ; AW-AM510-I ; AW-AM510MA
Applicant	:	AzureWave Technologies, Inc. 8F., No.94, Baozhong Rd. , Xindian Dist., New Taipei City , Taiwan 231
Manufacturer	:	AzureWave Technologies, Inc. 8F., No.94, Baozhong Rd. , Xindian Dist., New Taipei City , Taiwan 231
Standard	:	47 CFR Part 2.1091

The product was received on Mar. 15, 2021, and testing was started from Mar. 16, 2021 and completed on Apr. 20, 2021. 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.)

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History of this test report

Report No.	Version	Description	Issued Date
FA131001	01	Initial issue of report	May 14, 2021

Summary of Test Result

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

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
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)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / π/4-DQPSK / 8DPSK) LE: GFSK

1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	Molex	1461531050	Dipole	I-PEX	Note 1
2	1	MAG. LAYERS	MSA-4008-25GC1-A2	PIFA	I-PEX	Note 1
3	1	LYNwave	5-PP005421	PIFA	I-PEX	Note 1

Note1:

Ant.	Antenna Gain (dBi)		
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth
1	3.20	4.25	3.20
2	2.98	5.16	2.98
3	2.90	4.30	2.90

Note2: The above information was declared by manufacturer.

Note3:

<For conducted test>

2.4GHz and Bluetooth

Only the higher gain antenna “Ant. 1” was tested and recorded in the report.

5GHz

Only the higher gain antenna “Ant. 2” was tested and recorded in the report.

<For WLAN 2.4GHz>

For IEEE 802.11b/g/n mode (1TX/1RX)

Only Port 1 can be used as transmitting/receiving.

<For WLAN 5GHz>

For IEEE 802.11a/n mode (1TX/1RX)

Only Port 1 can be used as transmitting/receiving.

<For Bluetooth> (1TX/1RX)

Only Port 1 can be used as transmitting/receiving.

1.3 Table for Multiple Listing

Model No.	Description
AW-AM510	All the model names are identical, the difference model names served as marketing strategy.
AW-AM510-I	
AW-AM510MA	

Note 1: From the above models, model: AW-AM510 was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.4 Accessories

N/A

1.5 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/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/ 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/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 (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)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
2.4G;G1D	3.20	22.66	25.86	0.50	26.36	0.43251	20	0.08605	1.00000
5.2G;D1D	5.16	16.27	21.43	0.50	21.93	0.15596	20	0.03103	1.00000
5.3G;D1D	5.16	19.99	25.15	0.50	25.65	0.36728	20	0.07307	1.00000
5.6G;D1D	5.16	19.53	24.69	0.50	25.19	0.33037	20	0.06573	1.00000
5.8G;D1D	5.16	20.11	25.27	0.50	25.77	0.37757	20	0.07512	1.00000
2.4G;BT-EDR	3.20	5.71	8.91	0.50	9.41	0.00873	20	0.00174	1.00000
2.4G;BT-LE	3.20	8.59	11.79	0.50	12.29	0.01694	20	0.00337	1.00000

Simultaneous Transmission Analysis Mode:

Test Mode 1: WLAN 2.4GHz + Bluetooth

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)	Ratio (S/Limit)
2.4G;G1D	3.20	22.66	25.86	0.50	26.36	0.43251	20	0.08605	1.00000	0.08605
2.4G;BT-LE	3.20	8.59	11.79	0.50	12.29	0.01694	20	0.00337	1.00000	0.00337
									Sum Ratio	0.08942
									Ratio Limit	1

Test Mode 2: WLAN 5GHz + Bluetooth

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)	Ratio (S/Limit)
5.8G;D1D	5.16	20.11	25.27	0.50	25.77	0.37757	20	0.07512	1.00000	0.07512
2.4G;BT-LE	3.20	8.59	11.79	0.50	12.29	0.01694	20	0.00337	1.00000	0.00337
									Sum Ratio	0.07849
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

———THE END———