



RADIO EXPOSURE TEST REPORT

FCC ID : TLZ-XM9098

Equipment : IEEE 802.11X2 WiFi 6 SU and MU-MIMO DBC
Wireless LAN + Bluetooth 5.1 Combo Module

Brand Name : AzureWave

Model Name : AW-XM458, AW-XM369, AW-XM458MA-XXX,
AW-XM369MA-XXX

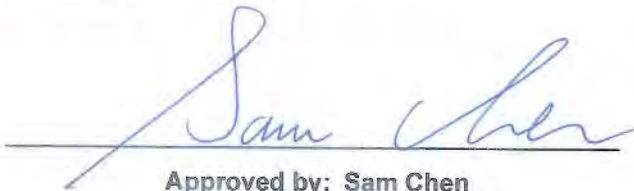
Applicant : AzureWave Technologies, Inc.
8F., No.94, Baozhong Rd. , Xindian Dist., New
Taipei City , Taiwan 231

Manufacturer : AzureWave Technologies (Shanghai) Inc.
No. 1355, Jiaxin Road, Malu Twon, Jiading District
Shanghai, P.R. China

Standard : 47 CFR Part 2.1091

The product was received on Apr. 13, 2021, and testing was started from May 28, 2021 and completed on Sep. 24, 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

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History of this test report

Report No.	Version	Description	Issued Date
FA132339	01	Initial issue of report	Sep. 29, 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) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
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) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: GFSK



1.2 Antenna Information

Ant.	Port		Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	2.4GHz	5GHz					
1	1	1	MAG. LAYERS	MSA-4008-25GC1-A2	PIFA	I-PEX	Note 1
2	2	2	MAG. LAYERS	MSA-4008-25GC1-A2	PIFA	I-PEX	
3	1	1	MAG. LAYERS	MSA-4008-25GC1-A2	PIFA	I-PEX	

Note1:

Ant.	Port		Antenna Gain (dBi)		
	2.4GHz	5GHz	WLAN 2.4GHz	WLAN 5GHz	Bluetooth
1	1	1	2.98	5.16	-
2	2	2	2.98	5.16	-
3	1	1	-	-	2.98

Note2: The above information was declared by manufacturer.

Note3:

<WLAN 2.4GHz Function>

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

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

Port 1 and Port 2 could transmit/receive simultaneously.

<WLAN 5GHz Function>

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

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

Port 1 and Port 2 could transmit/receive simultaneously.

<Bluetooth Function> (1TX/1RX)

Only Port 1 can be used as transmitting/receiving.



1.3 Table for Multiple Listing

Model No.	GPIO	Description
AW-XM458	Without GPIO	All the model names are identical, the difference model names served as marketing strategy.
AW-XM369		
AW-XM458MA-XXX	With GPIO	All the model names are identical, the difference model names served as marketing strategy.
AW-XM369MA-XXX		

Note 1: From the above models, model: AW-XM458MA-XXX 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/ 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 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	2.98	22.18	25.16	0.50	25.66	0.36813	20	0.07324	1.00000
5.2G;D1D	8.17	21.75	29.92	0.07	29.99	0.99770	20	0.19849	1.00000
5.3G;D1D	8.17	21.61	29.78	0.21	29.99	0.99770	20	0.19849	1.00000
5.6G;D1D	8.17	21.70	29.87	0.12	29.99	0.99770	20	0.19849	1.00000
5.8G;D1D	8.17	23.64	31.81	0.50	32.31	1.70216	20	0.33863	1.00000
2.4G;BT-BR	2.98	2.44	5.42	0.50	5.92	0.00391	20	0.00078	1.00000
2.4G;BT-LE	2.98	3.66	6.64	0.50	7.14	0.00518	20	0.00103	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + 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)
2.4G;G1D	2.98	22.18	25.16	0.50	25.66	0.36813	20	0.07324	1.00000	0.07324
5.8G;D1D	8.17	23.64	31.81	0.50	32.31	1.70216	20	0.33863	1.00000	0.33863
2.4G;BT-LE	2.98	3.66	6.64	0.50	7.14	0.00518	20	0.00103	1.00000	0.00103
									Sum Ratio	0.41290
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————