

RF Exposure Report

Report No.: SA150126E05K

FCC ID: TLZ-CM2XXNF

Test Model: AW-CM195NF

Series Model: AW-CM217NF, AW-CM235NF, AW-CM240NF

Received Date: Aug. 17, 2018

Test Date: Oct. 30 to 31, 2018

Issued Date: Nov. 06, 2018

Applicant: AzureWave Technologies, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Taiwan R.O.C.

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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA150126E05K	Original release.	Nov. 06, 2018

1 Certificate of Conformity

Product: IEEE 802.11 a/b/g/n/ac Wireless LAN and Bluetooth M.2 Combo Module

Brand: AzureWave

Test Model: AW-CM195NF

Series Model: AW-CM217NF, AW-CM235NF, AW-CM240NF

Sample Status: ENGINEERING SAMPLE

Applicant: AzureWave Technologies, Inc.

Test Date: Oct. 30 to 31, 2018

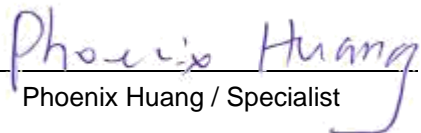
Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

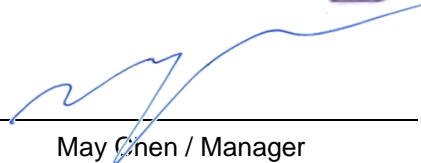
Prepared by :


Phoenix Huang / Specialist

Date:

Nov. 06, 2018

Approved by :


May Chen / Manager

Date:

Nov. 06, 2018

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
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

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No	Chain No.	Brand	Model	Gain (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (External only)	
1	Chain (0) (Aux)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	PIFA	i-pex(MHF4)	2.4~2.5	15cm	
				5.16			4.9~5.9		
	Chain (1) (Main)	MAG.LAYERS	MSA-4008-25GC1-A1	2.98	PIFA	i-pex(MHF4)	2.4~2.5	15cm	
				5.16			4.9~5.9		
2	Chain (0) (Aux)	LUXSHARE ICT	Speedy	1.43	PIFA	i-pex(MHF4)	2.4~2.5	507mm	
				-3.12			4.9~5.9		
	Chain (1) (Main)	LUXSHARE ICT	Speedy	-2.46	PIFA	i-pex(MHF4)	2.4~2.5	472mm	
				-0.02			4.9~5.9		
3	Chain (0) (Aux)	Amphenol	867-00013	-3.8	PIFA	i-pex(MHF4)	2.4~2.5	70mm	
				3.5			4.9~5.9		
	Chain (1) (Main)	Amphenol	867-00014	-5.1	PIFA	i-pex(MHF4)	2.4~2.5	220mm	
				0.2			4.9~5.9		
Antenna Set No	Chain No.	Brand	Model	Gain (dBi) Including cable loss	Cable Loss (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (External only)
4	Chain (0) (Aux)	TONGDA	T-543-3010450-2	-4.23	0.46	PIFA	i-pex-MFH4	2.4~2.5	79.5mm
				5.15-5.35 GHz:2.13	0.73			4.9~5.9	
	Chain (1) (Main)	TONGDA	T-543-3010450-1	-4.56	0.28	PIFA	i-pex-MFH4	2.4~2.5	43mm
				5.15-5.35 GHz:-3.53	0.44			4.9~5.9	
5	Chain (0) (Aux)	HONGLIN	260-26080	-4.39	0.46	PIFA	i-pex-MFH4	2.4~2.5	79.5mm
				5.15-5.35 GHz:1.29	0.73			4.9~5.9	
	Chain (1) (Main)	HONGLIN	260-26079	-4.71	0.28	PIFA	i-pex-MFH4	2.4~2.5	43mm
				5.15-5.35 GHz:-3.73	0.44			4.9~5.9	
6	Chain 0 (Aux)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
7	Chain 0 (Aux)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	
8	Chain 0 (Aux)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
9	Chain 0 (Aux)	Taoglas	GW20.54.0400A.km	2.29	NA	Dipole	IPEX MHF4L	2400~2500	400mm
				1.73				5150~5850	
	Chain 1 (Main)	Taoglas	GW20.54.0180A.km	2.47	NA	Dipole	IPEX MHF4L	2400~2500	180mm
				2.62				5150~5850	

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4GHz	2437	430.629	5.99	20	0.34028	1
WLAN U-NII-1	5240	175.268	8.17	20	0.22879	1
WLAN U-NII-2A	5260	173.966	8.17	20	0.22709	1
WLAN U-NII-2C	5550	175.508	8.17	20	0.22910	1
WLAN U-NII-3	5795	164.255	8.17	20	0.21441	1
BT-EDR	2480	9.661	2.98	20	0.00382	1
BT-LE	2480	7.112	2.98	20	0.00281	1

Note:

2.4GHz: The directional gain = 2.98dBi + 10log(2) = 5.99dBi

5GHz: The directional gain = 5.16dBi + 10log(2) = 8.17dBi

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 +etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 5GHz + Bluetooth = 0.22910 / 1 + 0.00382 / 1 = 0.23292

Therefore the maximum calculations of above situations are less than the "1" limit.

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