

RF Exposure Report

Report No.: SA150126E05

FCC ID: TLZ-CM2XXNF

Test Model: AW-CM195NF

Series Model: AW-CM217NF, AW-CM235NF

Received Date: Jan. 26, 2015

Test Date: Feb. 03 to 17, 2015

Issued Date: Feb. 25, 2015

Applicant: AzureWave Technologies, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Release Control Record

Issue No.	Description	Date Issued
SA150126E05	Original release.	Feb. 25, 2015

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

Sample Status: ENGINEERING SAMPLE

Applicant: AzureWave Technologies, Inc.

Test Date: Feb. 03 to 17, 2015

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D03

IEEE C95.1

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 :  , Date: Feb. 25, 2015

Midoli Peng / Specialist

Approved by :  , Date: Feb. 25, 2015

May Chen / Manager

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				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz

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**.

3 Antenna Gain

The antennas provided to the EUT, please refer to the following table:

Antenna No	Chain No.	Brand	Model	Gain (dBi)	Antenna Type	Connector Type	Frequency range (GHz to GHz)	Cable Length (External only)
1	Chain (0)	MAG.LAYERS	MSA-4008-25 GC1-A1	2.98	PIFA	i-pex(MHF)	2.4~2.5	15cm
				5.16			4.9~5.9	
	Chain (1)	MAG.LAYERS	MSA-4008-25 GC1-A1	2.98 5.16	PIFA	i-pex(MHF)	2.4~2.5 4.9~5.9	15cm

4 Calculation Result Of Maximum Conducted Power

For WLAN: 15.247(2.4GHz)

802.11b

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 - 2462	179.473	2.98	20	0.07091	1

802.11g

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 - 2462	270.396	2.98	20	0.10684	1

802.11n (HT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 - 2462	466.771	2.98	20	0.18443	1

802.11n (HT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2422 - 2452	233.435	2.98	20	0.09223	1

For WLAN: 15.407(5GHz)

802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 ~ 5240	74.645	5.16	20	0.04872	1
5260 ~ 5320	72.611	5.16	20	0.04739	1
5500 ~ 5700	79.433	5.16	20	0.05185	1
5745 ~ 5825	89.536	5.16	20	0.05844	1

802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 ~ 5240	177.07	5.16	20	0.11558	1
5260 ~ 5320	177.92	5.16	20	0.11613	1
5500 ~ 5700	176.033	5.16	20	0.05127	1
5745 ~ 5825	178.144	5.16	20	0.05752	1

802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5190 ~ 5230	143.474	5.16	20	0.09365	1
5270 ~ 5310	177.438	5.16	20	0.11582	1
5510 ~ 5670	177.863	5.16	20	0.11610	1
5755 ~ 5795	66.84	5.16	20	0.04363	1

802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5210	72.853	5.16	20	0.04755	1
5290	55.422	5.16	20	0.03618	1
5530 ~ 5690	148.092	5.16	20	0.09666	1
5775	25.412	5.16	20	0.01659	1

For Bluetooth:

GFSK

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2402-2480	9.705	2.98	20	0.00383	1

8DPSK

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2402-2480	7.656	2.98	20	0.00303	1

BT-LE (GFSK)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2402-2480	7.261	2.98	20	0.00287	1

Conclusion:

Both of the WLAN (5GHz) and Bluetooth can transmit simultaneously, the formula of calculated the MPE is:

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

For WLAN (5GHz) and Bluetooth:

Therefore, the worst-case situation is $0.11613 / 1 + 0.00383 / 1 = 0.11996$, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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