

RF Exposure Report

Report No.: SA170807E03

FCC ID: TLZ-CU302

Test Model: AW-CU302

Received Date: Aug. 07, 2017

Test Date: Sep. 18, 2017

Issued Date: Sep. 27, 2017

Applicant: AzureWave Technologies, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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Test Location : E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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Release Control Record

Issue No.	Description	Date Issued
SA170807E03	Original release.	Sep. 27, 2017

1 Certificate of Conformity

Product: IEEE 802.11 b/g/n + Bluetooth 4.2 LE WLAN/BT Microcontroller Module

Brand: AzureWave

Test Model: AW-CU302

Sample Status: ENGINEERING SAMPLE

Applicant: AzureWave Technologies, Inc.

Test Date: Sep. 18, 2017

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

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 :

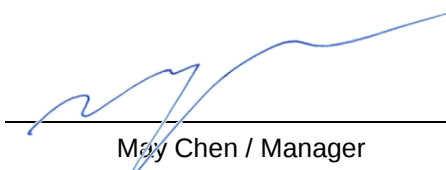


Date:

Sep. 27, 2017

Claire Kuan / Specialist

Approved by :



Date:

Sep. 27, 2017

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

$$Pd = (P_{out} * G) / (4 * \pi * r^2)$$

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.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connecter Type	Cable Length
1(Internal)	AzureWave	AW-CU302 ANT	2.5	2.4~2.4835GHz	Chip	NA	NA
2(External)	TAOGLAS	FXP73.07.0100A	3	2.4~2.4835GHz	Monopole	I-PEX	100mm
3(External)	TAOGLAS	PC11.07.0100A	3	2.4~2.4835GHz	Dipole	I-PEX	100mm
4(External)	TAOGLAS	FXP74.07.0100A	4	2.4~2.4835GHz	PIFA	I-PEX	100mm
5(External)	TAOGLAS	PC17.07.0070A	0.9	2.4~2.4835GHz	PIFA	I-PEX	70mm
6(External)	TAOGLAS	GW.17.07.0250E	2.7	2.4~2.4835GHz	Dipole	I-PEX	250mm
7(External)	TAOGLAS	FXP840.07.0055B	2	2.4~2.4836GHz	PIFA	I-PEX	55mm
8(External)	TAOGLAS	FXP75.07.0045B	2.5	2.4~2.4836GHz	PIFA	I-PEX	45mm
9(External)	LAIRD	NanoBlue-IP4 MAF94045	2	2.4~2.4835GHz	Dipole	I-PEX	100mm
10(External)	LAIRD	EBL2400A1-23UFL	2.45	2.4~2.4835GHz	Dipole	I-PEX	230mm
11(External)	LAIRD	NanoBlade-IP04 CAF94505	2	2.4~2.4835GHz	Dipole	I-PEX	100mm
12(External)	MOLEX	1461530100	3	2.4~2.4835GHz	Dipole	I-PEX	100mm
13(External)	MOLEX	1461530150	2.8	2.4~2.4835GHz	Dipole	I-PEX	150mm
14(External)	MOLEX	1461530200	2.6	2.4~2.4835GHz	Dipole	I-PEX	200mm
15(External)	MOLEX	1461530250	2.4	2.4~2.4835GHz	Dipole	I-PEX	250mm
16(External)	MOLEX	1461530300	2.2	2.4~2.4835GHz	Dipole	I-PEX	300mm
17(External)	MOLEX	2042810050	2.2	2.4~2.4835GHz	Dipole	I-PEX	50mm
18(External)	MOLEX	2042810100	2	2.4~2.4835GHz	Dipole	I-PEX	100mm
19(External)	MOLEX	2042810150	1.8	2.4~2.4835GHz	Dipole	I-PEX	150mm
20(External)	MOLEX	2042810200	1.6	2.4~2.4835GHz	Dipole	I-PEX	200mm
21(External)	MOLEX	2042810250	1.4	2.4~2.4835GHz	Dipole	I-PEX	250mm
22(External)	MOLEX	2042810300	1.2	2.4~2.4835GHz	Dipole	I-PEX	300mm
23(External)	YAGEO	ANTX100F113B24003	2.9	2.4~2.4835GHz	PIFA	I-PEX	100mm
24(External)	YAGEO	ANTX100P113B24003	2.8	2.4~2.4835GHz	PIFA	I-PEX	100mm
25(External)	LYNWAVE	ALA110-052020	2	2.4~2.4835GHz	Dipole	I-PEX	50mm
26(External)	LYNWAVE	ALA120-052024	2	2.4~2.4835GHz	Dipole	I-PEX	160mm
27(External)	LYNWAVE	ALA150-052020	2	2.4~2.4835GHz	Dipole	I-PEX	85mm
28(External)	LYNWAVE	ALA140-05102J	2	2.4~2.4835GHz	Dipole	I-PEX	40mm
29(External)	LYNWAVE	ALA120-051020	2	2.4~2.4835GHz	Dipole	I-PEX	50mm
30(External)	LYNWAVE	ALA120-051022	2	2.4~2.4835GHz	Dipole	I-PEX	30mm
31(External)	LYNWAVE	ALA140-051020	1.88	2.4~2.4835GHz	Dipole	I-PEX	70mm
32(External)	LYNWAVE	ALA150-05102B	2	2.4~2.4835GHz	Dipole	I-PEX	10mm
33(External)	LYNWAVE	ALA150-05102C	2	2.4~2.4835GHz	Dipole	I-PEX	75mm
34(External)	LYNWAVE	ALA150-05102F	2	2.4~2.4835GHz	Dipole	I-PEX	140mm
35(External)	LYNWAVE	ALA150-05102J	2	2.4~2.4835GHz	Dipole	I-PEX	100mm
36(External)	LYNWAVE	ALA140-05102D	2	2.4~2.4835GHz	Dipole	I-PEX	95mm
37(External)	LYNWAVE	ALA150-051026	2	2.4~2.4835GHz	Dipole	I-PEX	150mm

From the above antennas, antenna 1, 2, 3, 4 were selected for the test and its data was recorded in this report.

3 Calculation Result of Maximum Conducted Power

WLAN

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	290.402	4.00	20	0.14512	1

BT-LE

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	0.9183	4.00	20	0.00046	1

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN + Bluetooth = $0.14512 / 1 + 0.00046 / 1 = 0.14558$

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

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