



RADIO EXPOSURE TEST REPORT

FCC ID : TLZ-CM467

Equipment : IEEE 802.11 a/b/g/n/ac and Bluetooth 5.0 Module

Brand Name : AzureWave

Model Name : AW-CM467-SUR, AW-CM467-USB,
AW-CM467-SUR-I, AW-CM467-USB-I

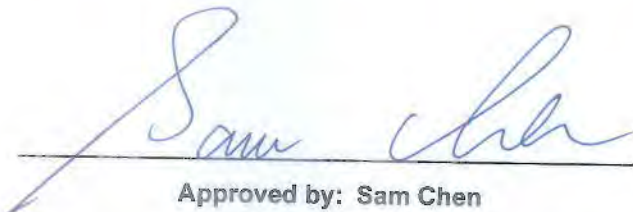
Applicant : AzureWave Technologies, Inc.
8F., No.94, Baozhong Rd. , Xindian Dist., New
Taipei City , Taiwan 231

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 Aug. 30, 2021, and testing was started from Sep. 11, 2021 and completed on Dec. 08, 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

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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: Penny Kao



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 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: GFSK

**1.1.1 Antenna Information**

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)		Remark
						WLAN 2.4GHz / Bluetooth	WLAN 5GHz	
1	1	Nienyi	NYS4939	PCB	I-PEX	3.58	3.89	External
2	1	Genesis	650-10045-01	PCB	I-PEX	2.50	3.85	External
3	1	Lynwave	5-PP005737	PCB	I-PEX	4.20	3.60	Internal
4	1	Maglayers	MSA-4008-25GC1-A1	PIFA	I-PEX	2.98	5.16	External
5	1	Maglayers	MSA-4008-25GC1-A2	PIFA	I-PEX	2.98	5.16	External

Note 1: The above information was declared by manufacturer.

Note 2: The EUT has five antennas.

For RF Exposure, only the highest gain antenna "Ant. 3" for WLAN 2.4GHz/Bluetooth and "Ant.4" for WLAN 5GHz were selected to test and recorded in the report.

For 2.4GHz WLAN function**IEEE 802.11b/g/n mode (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving.

For 5GHz WLAN function**IEEE 802.11a/n/ac mode (1TX/1RX):**

Only Port 1 can be used as transmitting/receiving.

For Bluetooth function (1TX/1RX):

Only Port 1 can be used as transmitting/receiving.



1.1.2 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

EUT	Model Name	Interface	Equip Antenna	Description
1	AW-CM467-SUR	SDIO-UART	External or Internal Antenna	All the models are identical, the difference model for difference brand served as marketing strategy.
	AW-CM467-SUR-I			
2	AW-CM467-USB	USB-USB	External Antenna	All the models are identical, the difference model for difference brand served as marketing strategy.
	AW-CM467-USB-I			

Note 1: After evaluating, AW-CM467-USB (EUT 2) 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.

1.2 Accessories

N/A



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:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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;D1D	4.20	17.22	21.42	0.50	21.92	0.15560	20	0.03096	1.00000
5.2G;D1D	5.16	19.16	24.32	0.50	24.82	0.30339	20	0.06036	1.00000
5.3G;D1D	5.16	19.34	24.50	0.50	25.00	0.31623	20	0.06291	1.00000
5.6G;D1D	5.16	19.02	24.18	0.50	24.68	0.29376	20	0.05844	1.00000
5.8G;D1D	5.16	19.34	24.50	0.50	25.00	0.31623	20	0.06291	1.00000
2.4G;BT-BR	4.20	8.66	12.86	0.50	13.36	0.02168	20	0.00431	1.00000
2.4G;BT-LE	4.20	8.55	12.75	0.50	13.25	0.02113	20	0.00420	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz with Ant.3 + Bluetooth with Ant.3

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;D1D	4.20	17.22	21.42	0.50	21.92	0.15560	20	0.03096	1.00000	0.03096
2.4G;BT-BR	4.20	8.66	12.86	0.50	13.36	0.02168	20	0.00431	1.00000	0.00431
									Sum Ratio	0.03527
									Ratio Limit	1

Simultaneous Transmission Analysis Mode: WLAN 5GHz with Ant.4 + Bluetooth with Ant.3

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)
5.3G;D1D	5.16	19.34	24.50	0.50	25.00	0.31623	20	0.06291	1.00000	0.06291
2.4G;BT-BR	4.20	8.66	12.86	0.50	13.36	0.02168	20	0.00431	1.00000	0.00431
									Sum Ratio	0.06722
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————