

Radio Exposure Evaluation Report

FCC ID : R49MCW10

Equipment : Wireless LAN Unit

Brand Name : STAR MICRONICS CO., LTD.

Model Name : MCW10

Applicant : STAR MICRONICS CO., LTD.
20-10 NAKAYOSHIDA, SURUGA-ku, SHIZUOKA-shi,
SHIZUOKA 422-8654, JAPAN

Manufacturer : EDIMAX TECHNOLOGY CO., LTD.
No. 278, Xinhua 1st Rd., Neihu Dist., Taipei City, Taiwan.

Standard : 47 CFR FCC Part 2 Subpart J, section 2.1091

The product was received on Jan. 27, 2021, and testing was started from Jan. 27, 2021 and completed on May 10, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR FCC Part 2 Subpart J, section 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. Hsinhua Laboratory, the test report shall not be reproduced except in full.



Approved by: Allen Lin

SPORTON INTERNATIONAL INC. Hsinhua Laboratory
No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)



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Photographs of EUT V01





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:

None

Reviewed by: Ben Tseng

Report Producer: Debby Hung

1 General Description

1.1 Information

1.1.1 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 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector
1	LYNwave	ALX20M-052AA2	PIFA antenna	N/A
2	LYNwave	ALX20M-092AA2	PIFA antenna	N/A

Ant.	Port	Gain (dBi)				
		2.4G	5G			
			U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
1	1	3.3	-	-	-	-
2	1	-	2.2	2.2	2.2	1.7

For 2.4GHz function:

For IEEE 802.11 b/g/n mode (1TX/1RX)

Ant. 1 (port 1) could transmit/receive.

For 5GHz function:

For IEEE 802.11 a/n/ac mode (1TX/1RX)

Ant. 2 (port 1) could transmit/receive.

1.1.3 Table for Multiple Listing

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

Sku	Item	Brand Name	Model Name	Description
1	LAN transformer	FUN-JIN	F1281DG 1445	There are two LAN transformers which only the brand and model name is different as second source.
2		TAG	MC1201A	

1.1.4 Accessories

Accessories				
Micro USB Cable	Brand Name	Always Tai Lai	Model Name	ATL-1312
	Signal Line	0.35 meter, non-shielded cable, w/o ferrite core		
RJ45 Cable	Brand Name	Always Tai Lai	Model Name	ATL-1311
	Signal Line	0.28 meter, non-shielded cable		

Reminder: Regarding to more detail and other information, please refer to user manual.

1.2 Testing Location

Test Lab. : Sporton International Inc. Hsinhua Laboratory			
☒	Hsinhua (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)	
		TEL: 886-3-327-3456	FAX: 886-3-327-0973
Test site Designation No. TW3785 with FCC.			
☐	Wen 33rd.St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)	
		TEL: 886-3-318-0787	FAX: 886-3-318-0287
Test site Designation No. TW0008 with FCC.			

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

WLAN 2.4G Function:

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	3.30	23.96	27.26	0.50	27.76	0.59704	20	0.11878	1.00000
2.4G;D1D	3.30	21.79	25.09	0.50	25.59	0.36224	20	0.07207	1.00000

WLAN 5G Function:

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)
5.2G;D1D	2.20	21.87	24.07	0.50	24.57	0.28642	20	0.05698	1.00000
5.3G;D1D	2.20	20.62	22.82	0.50	23.32	0.21478	20	0.04273	1.00000
5.6G;D1D	2.20	20.20	22.40	0.50	22.90	0.19498	20	0.03879	1.00000
5.8G;D1D	1.70	22.56	24.26	0.50	24.76	0.29923	20	0.05953	1.00000

————THE END————