



FCC RADIO EXPOSURE TEST REPORT

FCC ID : MSQ-RTAXJE00

Equipment : AX1800 Dual Band WiFi Router

Brand Name : ASUS

Model Name : XD4R, ZenWiFi AX Mini (XD4R), ZenWiFi AX Mini, ASUS ZenWiFi, ASUS ZenWiFi AX Mini

Applicant : ASUSTeK COMPUTER INC.
1F., No. 15, Lide Rd., Beitou, Taipei 112, Taiwan

Manufacturer (1) : Datamax Electronics (DongGuan) Co., Ltd.
Niu Shan Foreign Economic Industrial Park, Dong Cheng District, Dong Guan City, Guang Dong, China

Manufacturer (2) : Lukisen Electronic Corp.
3F., No. 236, Boai St., Shulin Dist., New Taipei City 23845, Taiwan

Manufacturer (3) : Kentec Inc.
No. 5, Tzu-Chiang 1st Rd. Chungli Industrial Zone, Taoyuan City, Taiwan

Standard : 47 CFR Part 2.1091

The product was received on Dec. 24, 2019, and testing was started from Dec. 25, 2019 and completed on Mar. 20, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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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: Cindy Peng



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) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK

1.2 Table for EUT Supports Functions

Function	Support Type
AP Router	Master
Bridge	Client without radar detection
Repeater	Master
Mesh	Master



1.3 Table for Multiple Listing

1. There are two EUTs, the difference as following:

EUT	2.4G PA	
	Brand Name	Model Name
1	Qorvo	QPF4206B
2	Skyworks	SKY85337

2. The EUT has five model names which are identical to each other in all aspects except for the following table:

Model Name	Description
XD4R	There is nothing different for two model names, just for different marketing use.
ZenWiFi AX Mini (XD4R)	
ZenWiFi AX Mini	
ASUS ZenWiFi	
ASUS ZenWiFi AX Mini	

From the above models, model: XD4R was selected as representative model for the test and its data was recorded in this report.

1.4 Testing Location

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

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)*	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)*	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 (EUT 1)	3.68	28.65	32.33	0.50	32.83	1.91867	20	0.381710	1.00000
2.4G;D1D (EUT 2)	3.68	28.56	32.24	0.50	32.74	1.87932	20	0.37387	1.00000
5.2G;D1D	3.85	29.92	33.77	0.50	34.27	2.67301	20	0.53178	1.00000
5.8G;D1D	4.08	29.98	34.06	0.50	34.56	2.85759	20	0.56849	1.00000
2.4G;BT-LE	1.69	0.87	2.56	0.50	3.06	0.00202	20	0.00040	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz + Bluetooth

Test Mode 1: EUT 1 - WLAN 2.4GHz + WLAN 5GHz + Bluetooth

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	3.68	28.65	32.33	0.50	32.83	1.91867	20	0.38170	1	0.38170
5.8G;D1D	4.08	29.98	34.06	0.50	34.56	2.85759	20	0.56849	1	0.56849
2.4G;BT-LE	1.69	0.87	2.56	0.50	3.06	0.00202	20	0.00040	1	0.00040
									Sum Ratio	0.95059
									Ratio Limit	1

Test Mode 2: EUT 2 - WLAN 2.4GHz + WLAN 5GHz + Bluetooth

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	3.68	28.56	32.24	0.50	32.74	1.87932	20	0.37387	1	0.37387
5.8G;D1D	4.08	29.98	34.06	0.50	34.56	2.85759	20	0.56849	1	0.56849
2.4G;BT-LE	1.69	0.87	2.56	0.50	3.06	0.00202	20	0.00040	1	0.00040
									Sum Ratio	0.95059
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—————THE END—————