

Radio Exposure Evaluation Report

FCC ID : SWX-UBB
Equipment : UniFi Building Bridge
Brand Name : UBIQUITI
Model Name : UBB
Applicant : Ubiquiti Inc.
685 Third Avenue, New York, New York 10017 USA
Manufacturer : Ubiquiti Inc.
685 Third Avenue, New York, New York 10017 USA
Standard : 47 CFR Part 2.1091

The product was received on May 02, 2019, and testing was started from May 03, 2019 and completed on May 03, 2019. 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, KDB447498 D01 General RF Exposure Guidance v06 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 United States 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: Allen Lin

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:

None.

Reviewed by: Sam Tsai

Report Producer: Jenny Yang

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 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Bluetooth	2400-2483.5	2402-2480	LE: DSSS (GFSK)
60GHz	57000-71000	Channel 1: 58320 Channel 2: 60480 Channel 3: 62640 Channel 4: 64800	$\pi/2$ -BPSK, $\pi/2$ -QPSK, $\pi/2$ -16QAM

1.2 Testing Location

Testing Location			
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
Test site Designation No. TW1190 with FCC.			

1.3 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA951623

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Frequency bands U-NII-2A and U-NII-2C was added	Exposure evaluation
The Applicant's Name and Manufacturer's Name were updated	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

WLAN 2.4GHz

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;11b	2.00	20.83	22.83	0.00	22.83	0.19187	20	0.03817	1.00000
2.4G;11n	2.00	20.51	22.51	0.00	22.51	0.17824	20	0.03546	1.00000

WLAN 5GHz

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;11ac	10.00	25.80	35.80	0.00	35.80	3.80189	20	0.75636	1.00000
5.3G;11ac	10.00	18.69	28.69	0.50	29.19	0.82985	20	0.16509	1.00000
5.6G;11ac	10.00	19.48	29.48	0.50	29.98	0.99541	20	0.19803	1.00000
5.8G;11ac	10.00	25.96	35.96	0.00	35.96	3.94457	20	0.78475	1.00000

60G

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)
62.64G	17.20	9.11	26.31	0.00	26.31	0.42756	20	0.08506	1.00000

BT

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)
BT LE	2.00	-3.87	-1.87	0.00	-1.87	0.00065	20	0.00013	1.00000

WLAN 2.4G + 60G + BT

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;11b	2.00	20.83	22.83	0.00	22.83	0.19187	20	0.03817	1.00000	0.03817
62.64G	17.20	9.11	26.31	0.00	26.31	0.42756	20	0.08506	1.00000	0.08506
BT LE	2.00	-3.87	-1.87	0.00	-1.87	0.00065	20	0.00013	1.00000	0.00013
									Sum Ratio	0.12336
									Ratio Limit	1

WLAN 2.4G + WLAN 5G + BT

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;11b	2.00	20.83	22.83	0.00	22.83	0.19187	20	0.03817	1.00000	0.03817
5.8G;11ac	10.00	25.96	35.96	0.00	35.96	3.94457	20	0.78475	1.00000	0.78475
BT LE	2.00	-3.87	-1.87	0.00	-1.87	0.00065	20	0.00013	1.00000	0.00013
									Sum Ratio	0.82305
									Ratio Limit	1

————THE END————