Radio Exposure Evaluation Report

FCC ID	:	**PPQ-WCBN3515A**
Equipment	:	**Wireless LAN module**
Brand Name	:	**LITE-ON**
Model Name	:	**WCBN3515A**
Applicant	:	**LITE-ON TECHNOLOGY CORP. Bldg. C, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C**
Manufacturer	:	**LITE-ON TECHNOLOGY (Changzhou) CO., LTD A9 Building,No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone ,Changzhou City,Jiangsu Province 213100 China**
Standard	:	**47 CFR FCC Part 2 Subpart J, section 2.1091**

The product was received on Feb. 24, 2020, and testing was started from Mar. 12, 2020 and completed on May 20, 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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History of this test report

Report No.	Version	Description	Issued Date
FA020615	01	Initial issue of report	May 27, 2021
FA020615	02	Antenna Information was updated This report is the latest version replacing for the report issued on May 27, 2021	Jun. 30, 2021

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: Yunha Liou

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 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM

1.1.2 Antenna Information

Case	Ant.	Brand	Model Name	Antenna Type	Connector
1	1	Itabashiseiki Co.,Ltd.	ANW-3001	Dipole	I-PEX
	2	Itabashiseiki Co.,Ltd.	ANW-3001	Dipole	I-PEX
2	3	INPAQ Technology Co.,Ltd	Patch-3001	Patch	I-PEX
	4	Itabashiseiki Co.,Ltd.	ANW-3001	Dipole	I-PEX
3	5	Itabashiseiki Co.,Ltd.	ANW-3001	Dipole	I-PEX
	6	INPAQ Technology Co.,Ltd	Patch-3001	Patch	I-PEX
4	7	INPAQ Technology Co.,Ltd	Patch-3001	Patch	I-PEX
	8	INPAQ Technology Co.,Ltd	Patch-3001	Patch	I-PEX

Case	Ant.	Port	Gain (dBi)		
			2.4G	5G Band 1	5G Band 4
1	1	1	2.8	3.5	4.6
	2	2	2.8	3.5	4.6
2	3	1	3.6	4.6	3.2
	4	2	2.8	3.5	4.6
3	5	1	2.8	3.5	4.6
	6	2	3.6	4.6	3.2
4	7	1	3.6	4.6	3.2
	8	2	3.6	4.6	3.2

Note 1: The EUT has four combination of antenna.
Note 2: EUT can match with above antennas for using. Higher gain in each case of antenna was used to perform the worst configuration and result of that was recorded as the final test result.

For 2.4GHz function:

For IEEE 802.11 b/g/n mode (2TX/2RX)
Port 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac mode (2TX/2RX)
Port 1 and Port 2 could transmit/receive simultaneously.

1.2 Testing Location

Test Lab.：Sporton International Inc. Hsinhua Laboratory			
☒	Hsinhua	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)	
	(TAF: 3785**)**	**TEL:** 886-3-327-3456	**FAX:** 886-3-327-0973
		Test site Designation No. TW3785 with FCC.	
☐	Wen 33rd.St.	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)	
	(TAF: 3785**)**	**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/ cm²)	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/ cm²)	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 (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

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)	Ratio (S/Limit)
2.4G;G1D	3.60	28.02	31.62	0.50	32.12	1.62930	20	0.32414	1.00000	0.32414
5.8G;D1D	4.60	28.62	33.22	0.50	33.72	2.35505	20	0.46852	1.00000	0.46852
									Sum Ratio	0.79266
									Ratio Limit	1

———THE END———