

Radio Exposure Evaluation Report

FCC ID : PPQ-WCBN3514A

Equipment : Wi-Fi (11a/b/g/n/ac 2Tx2R)+BT (V4.2LE) SDIO Combo Module

Brand Name : LITE-ON

Model Name : WCBN3514A

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 Part 2.1091

The product was received on Jan. 04, 2019, and testing was started from Apr. 08, 2019 and completed on Apr. 27, 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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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: Sam Tsai

Report Producer: Debby Hung

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	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: DSSS (GFSK)

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.			
☐	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL : 886-3-656-9065	FAX : 886-3-656-9085
Test site Designation No. TW0006 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	4.00	23.86	27.86	0.50	28.36	0.68549	20	0.13637	1.00000
2.4G;D1D	4.00	24.78	28.78	0.50	29.28	0.84723	20	0.16855	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	4.80	22.25	27.05	0.50	27.55	0.56885	20	0.11317	1.00000
5.3G;D1D	4.80	22.24	27.04	0.50	27.54	0.56754	20	0.11291	1.00000
5.6G;D1D	4.80	21.65	26.45	0.50	26.95	0.49545	20	0.09857	1.00000
5.8G;D1D	4.80	22.90	27.70	0.50	28.20	0.66069	20	0.13144	1.00000

WLAN Bluetooth 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;BT-LE	3.52	2.60	6.12	0.50	6.62	0.00459	20	0.00091	1.00000
2.4G;BT-BR	3.52	10.78	14.30	0.50	14.80	0.03020	20	0.00601	1.00000
2.4G;BT-EDR	3.52	7.45	10.97	0.50	11.47	0.01403	20	0.00279	1.00000

**WLAN 2.4G + WLAN Bluetooth 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)	Ratio (S/Limit)
2.4G;D1D	4.00	24.78	28.78	0.50	29.28	0.84723	20	0.16855	1.00000	0.16855
2.4G;BT-BR	3.52	10.78	14.30	0.50	14.80	0.03020	20	0.00601	1.00000	0.00601
									Sum Ratio	0.17456
									Ratio Limit	1

WLAN 5G + WLAN Bluetooth 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)	Ratio (S/Limit)
5.8G;D1D	4.80	22.90	27.70	0.50	28.20	0.66069	20	0.13144	1.00000	0.13144
2.4G;BT-BR	3.52	10.78	14.30	0.50	14.80	0.03020	20	0.00601	1.00000	0.00601
									Sum Ratio	0.13745
									Ratio Limit	1

—————THE END—————