TEST REPORT

Applicant:	Realtek Semiconductor Corp.
Address:	No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan
Equipment Type:	11ax RTL8852CE Combo module
Model Name:	RTL8852CE
Brand Name:	N/A
FCC ID:	TX2-RTL8852CE
Test Standard:	KDB 388624 D02 v18 (refer section 3.1)
Sample Arrival Date:	Dec. 23, 2022
Test Date:	Jan. 12, 2023 - Jan. 18, 2023
Date of Issue:	Jun. 01, 2023

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Fan Huimin **Checked by:** Xu Rui **Approved by:** Tolan Tu

(Testing Director)

Fan Huimin Xu Rui Tolan Tu

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Jun. 01, 2023	Initial Issue

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☑ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

1.3 Test Environment Condition

Ambient Temperature	18℃ to 25℃
Ambient Relative Humidity	30% to 70%

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Realtek Semiconductor Corp.
Address	No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

2.2 Manufacturer Information

Manufacturer	Realtek Semiconductor Corp.
Address	No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

2.3 General Description for Equipment under Test (EUT)

EUT Name	11ax RTL8852CE Combo module
Model Name Under Test	RTL8852CE
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.3.1 Host Information:

Product Name	Notebook Computer
Model Name	Yoga 7 16ARP8
Brand Name	Lenovo

2.4 Ancillary Equipment

Note: Not application.

2.5 Technical Information

Network and Wireless connectivity	Bluetooth (BR+EDR+BLE) 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20/40), VHT20/40 and 802.11ax(HE20/40) 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80/160) and 802.11ax(HE20/40/80/160), U-NII-1/2A/2C/3/4 6G WIFI 802.11ax(HE20/40/80/160), U-NII-5/6/7/8

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	2.4G WLAN, 5G WLAN, 6G WLAN, Bluetooth	
Frequency Range	802.11b/g	2412 MHz ~ 2472 MHz
	VHT20/VHT40	2412 MHz ~ 2472 MHz
	802.11ax(HE20/HE40)	2412 MHz ~ 2472 MHz
	802.11a	5150 MHz ~ 5250 MHz
		5250 MHz ~ 5350 MHz
		5470 MHz ~ 5725 MHz
		5725 MHz ~ 5850 MHz
	802.11 n(HT20/HT40)	5150 MHz ~ 5250 MHz
		5250 MHz ~ 5350 MHz
		5470 MHz ~ 5725 MHz
		5725 MHz ~ 5850 MHz
	802.11 ac(VHT20/VHT40/VHT80)	5150 MHz ~ 5250 MHz
		5250 MHz ~ 5350 MHz
		5470 MHz ~ 5725 MHz
		5725 MHz ~ 5850 MHz
	802.11 ax(HE20/HE40/HE80)	5150 MHz ~ 5250 MHz
		5250 MHz ~ 5350 MHz
		5470 MHz ~ 5725 MHz
		5725 MHz ~ 5850 MHz
	802.11 ac(VHT160)/ax(HE160)	5150 MHz ~ 5250 MHz
	802.11 ax(HE20/HE40/HE80/HE160)	5925 MHz ~ 6425 MHz
		6425 MHz ~ 6525 MHz
		6525 MHz ~ 6875 MHz
		6875 MHz ~ 7125 MHz
	Bluetooth	2402 MHz ~ 2480 MHz
Antenna Type	WLAN: PIFA Antenna Bluetooth: PIFA Antenna	
Hotspot Function	N/A	
Exposure Category	General Population/Uncontrolled exposure	
EUT Stage	Portable Device	
Product	Type	
	☒ Production unit	☐ Identical prototype

2.6 Remarks and Comments

The test report is validation of the G sensor functionality

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	KDB 388624 D02 v18	Pre-Approval Guidance List v18, PRE-APPROVAL GUIDANCE LIST

3.2 Test Results Summary

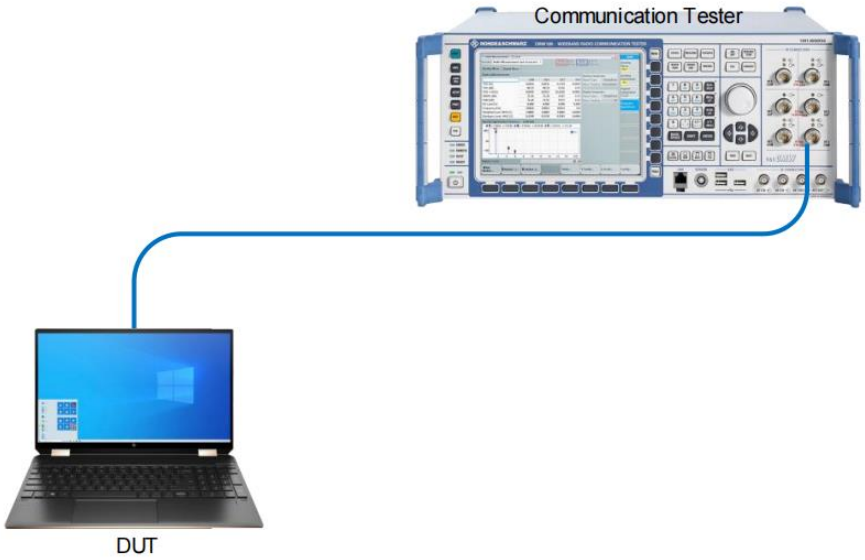
Device Mode	Lid Angle range	WLAN 2.4GHz(802.11b Channel 6)				WLAN 5GHz(802.11ac80 Channel 155)				WLAN 6GHz(802.11ax160 Channel 111)			
		Tune-up Power (dBm)		Measured Power(dBm)		Tune-up Power (dBm)		Measured Power(dBm)		Tune-up Power (dBm)		Measured Power(dBm)	
		Main. Antenna	Aux. Antenna	Main. Antenna	Aux. Antenna	Main. Antenna	Aux. Antenna	Main. Antenna	Aux. Antenna	Main. Antenna	Aux. Antenna	Main. Antenna	Aux. Antenna
Laptop	0° - 350°	16.50	16.50	16.40	16.40	13.50	13.50	13.40	13.39	13.00	13.00	12.95	12.90
Tablet	350° - 360°	16.00	16.00	15.90	15.90	10.00	10.00	9.77	9.83	11.00	11.00	10.88	10.84

4 MEASUREMENT SYSTEM

4.1 Conducted Power Test Setup

The conducted power measurement test setup is described in the following and illustrated in below figure.

1. The DUT is convertible PC from Lenovo model Yoga 7 16RP8. RTL8852CE connectivity module is installed.
2. A control PC is used to configure the call box as an access point to manage the uplink and downlink data traffic.
3. Uplink signal power is measured with the Call Box.
4. Path loss in the power measurement setup from the wireless module antenna port to the Call Box.



4.2 G-Sensor Conducted Power Test Procedure

The following additional guidance applies only to convertible laptops whose screen rotates around one axis, from 0 degrees to 360 degrees, in a clamshell style, i.e., from closed mode to open mode, to “tent” mode, and finally, to tablet mode. This process must be followed to determine the lid angle where a power reduction occurs, by taking power measurements at each step, as indicated in the step listed here below:

1. From the lid in closed mode (0 degrees), open the screen in 10-degree steps until laptop mode is obtained.
2. Lower the screen by 5 degrees increments to verify that the “closed mode” is triggered.
3. From the position of the previous step, open the screen in 1-degree increments until laptop mode is triggered again.
4. Continue opening the screen in 1-degree increments until at least 5 degrees past where “laptop mode” was obtained, then continue opening the screen in 10-degree steps until the device switches to tablet mode.
5. Reverse the previous procedure to go from tablet mode back down to closed mode.

5 TEST EQUIPMENTS LIST

Description	Manufacturer	Model	Serial No./Version	Cal. Date	Cal. Due
PC	Dell	N/A	N/A	N/A	N/A
Communication Tester	Rohde & Schwartz	CMW500	171150	2022/06/29	2023/06/28
RF Cable	N/A	N/A	N/A	N/A	N/A
Note: RF cable loss was verified before usage.					

ANNEX A CONDUCTED POWER TEST RESULT

A.1 Trigger lid angle detection and power verification 2.4GHz

A.1.1 The lid is rotating from 0° to 360°

Mode	Angele (degrees)	Measured Power 2.4GHz 802.11b Ch6 (dBm)	
		Main	Aux.
Laptop	0	16.01	16.10
	10	15.91	15.95
	20	15.99	16.04
	30	16.14	16.23
	40	16.32	15.95
	50	16.28	15.99
	60	16.38	16.01
	70	16.21	16.18
	80	16.19	15.96
	90	15.98	16.24
	100	16.30	16.08
	110	15.99	16.19
	120	16.37	16.38
	130	16.37	16.01
	140	16.22	16.25
	150	16.33	16.12
	160	16.28	15.96
	170	16.21	16.16
	180	16.32	16.09
	190	16.15	16.04
	200	16.20	16.12
	210	16.04	16.10
	220	16.01	16.26
	230	16.22	16.40

Mode	Angele (degrees)	Measured Power 2.4GHz 802.11b Ch6 (dBm)	
		Main	Aux.
Laptop	240	16.34	16.13
	250	16.17	16.27
	260	15.95	16.19
	270	16.11	16.19
	280	16.05	16.33
	290	16.40	15.95
	300	15.96	16.09
	310	16.22	16.07
	320	16.16	16.10
	330	16.15	16.09
	340	16.25	16.33
Tablet	350	15.56	15.55
Laptop	345	16.18	16.25
	346	16.21	16.18
	347	16.28	16.19
	348	16.31	16.22
	349	16.26	16.29
Tablet	350	15.61	15.63
	351	15.72	15.71
	352	15.75	15.70
	353	15.77	15.69
	354	15.71	15.81
	355	15.86	15.84
	360	15.88	15.78

A.1.2 The lid is rotating from 360° to 0°

Mode	Angele (degrees)	Measured Power 2.4GHz 802.11b Ch6 (dBm)	
		Main	Aux.
Tablet	360	15.61	15.49
	350	15.90	15.90
Laptop	340	16.38	16.26
	345	16.18	16.16
Tablet	350	15.84	15.68
Laptop	349	16.22	16.18
	348	16.21	16.15
	347	16.18	16.21
	346	16.18	16.23
	345	16.11	16.25
	340	16.02	16.26
	330	16.29	16.01
	320	15.94	15.94
	310	16.02	15.90
	300	15.90	16.17
	290	16.33	16.15
	280	16.37	16.03
	270	16.30	15.98
	260	15.97	16.23
	250	16.33	16.12
	240	16.10	16.35
	230	15.96	16.31

Mode	Angele (degrees)	Measured Power 2.4GHz 802.11b Ch6 (dBm)	
		Main	Aux.
Laptop	220	16.37	16.09
	210	16.40	16.00
	200	16.27	15.97
	190	16.20	16.28
	180	16.28	16.29
	170	16.18	15.90
	160	15.93	16.21
	150	16.23	16.03
	140	16.10	16.02
	130	15.99	16.06
	120	16.17	16.16
	110	16.37	16.16
	100	15.98	16.15
	90	15.95	16.33
	80	16.28	16.19
	70	16.31	15.97
	60	16.05	16.21
	50	16.18	16.04
	40	16.28	15.97
	30	16.02	16.15
	20	15.94	16.27
	10	16.28	16.38
	0	16.15	16.11

A.2 Trigger lid angle detection and power verification 5GHz

A.2.1 The lid is rotating from 0° to 360°

Mode	Angele (degrees)	Measured Power 5GHz 802.11ac80 Ch155 (dBm)	
		Main	Aux.
Laptop	0	13.05	12.93
	10	12.94	12.92
	20	13.31	13.39
	30	12.99	13.17
	40	13.02	13.17
	50	13.02	13.04
	60	13.31	13.08
	70	12.93	12.90
	80	3.21	13.11
	90	13.14	13.21
	100	13.37	12.92
	110	13.05	13.05
	120	13.13	12.99
	130	12.95	13.16
	140	13.30	13.13
	150	13.22	13.07
	160	13.33	13.30
	170	13.28	13.08
	180	13.33	13.22
	190	13.05	13.20
	200	13.11	13.07
	210	13.27	13.18
	220	13.00	12.91
	230	13.26	13.16

Mode	Angele (degrees)	Measured Power 5GHz 802.11ac80 Ch155 (dBm)	
		Main	Aux.
Laptop	240	13.17	12.90
	250	13.24	13.06
	260	12.97	13.07
	270	13.04	13.37
	280	13.13	12.98
	290	12.90	13.20
	300	13.01	13.20
	310	13.13	13.05
	320	12.92	13.00
	330	12.96	13.00
	340	13.13	13.13
Tablet	350	9.77	9.74
Laptop	345	13.15	13.23
	346	13.18	13.21
	347	13.20	13.18
	348	13.25	13.25
	349	13.19	13.22
Tablet	350	9.69	9.68
	351	9.55	9.69
	352	9.63	9.71
	353	9.68	9.78
	354	9.71	9.77
	355	9.75	9.75
	360	9.63	9.83

A.2.2 The lid is rotating from 360° to 0°

Mode	Angele (degrees)	Measured Power 5GHz 802.11ac80 Ch155 (dBm)	
		Main	Aux.
Tablet	360	9.54	9.45
	350	9.48	9.43
Laptop	340	13.19	13.04
	345	13.22	13.11
Tablet	350	9.55	9.56
Laptop	349	13.23	13.21
	348	13.20	13.18
	347	13.15	13.25
	346	13.29	13.19
	345	13.21	13.23
	340	13.25	13.16
	330	13.36	13.04
	320	12.96	13.24
	310	13.19	13.25
	300	12.97	13.14
	290	13.35	13.24
	280	13.14	12.95
	270	13.28	13.26
	260	13.09	12.97
	250	13.36	13.23
	240	13.30	13.00
	230	12.96	13.38

Mode	Angele (degrees)	Measured Power 5GHz 802.11ac80 Ch155 (dBm)	
		Main	Aux.
Laptop	220	13.14	13.23
	210	13.03	13.00
	200	13.24	13.38
	190	13.25	13.05
	180	13.29	13.06
	170	13.22	13.11
	160	13.10	12.91
	150	13.40	13.10
	140	13.03	13.33
	130	13.21	13.24
	120	13.18	13.19
	110	12.93	13.30
	100	13.31	13.02
	90	13.02	13.34
	80	13.10	13.00
	70	13.40	13.11
	60	13.28	13.32
	50	13.33	13.20
	40	13.22	13.15
	30	13.04	13.11
	20	13.36	13.06
	10	13.18	13.36
	0	13.22	13.04

A.3 Trigger lid angle detection and power verification 6GHz

A.3.1 The lid is rotating from 0° to 360°

Mode	Angele (degrees)	Measured Power 6GHz 802.11ax160 Ch111 (dBm)	
		Main	Aux.
Laptop	0	12.69	12.63
	10	12.74	12.45
	20	12.54	12.50
	30	12.75	12.51
	40	12.42	12.53
	50	12.87	12.53
	60	12.89	12.52
	70	12.62	12.66
	80	12.61	12.46
	90	12.57	12.68
	100	12.62	12.47
	110	12.56	12.61
	120	12.78	12.56
	130	12.40	12.63
	140	12.59	12.56
	150	12.49	12.66
	160	12.50	12.85
	170	12.45	12.42
	180	12.56	12.70
	190	12.74	12.82
	200	12.49	12.74
	210	12.53	12.72
	220	12.52	12.43
	230	12.50	12.88

Mode	Angele (degrees)	Measured Power 6GHz 802.11ax160 Ch111 (dBm)	
		Main	Aux.
Laptop	240	12.67	12.80
	250	12.42	12.90
	260	12.88	12.84
	270	12.48	12.71
	280	12.89	12.63
	290	12.75	12.69
	300	12.70	12.43
	310	12.62	12.63
	320	12.57	12.50
	330	12.69	12.76
	340	12.84	12.49
Tablet	350	10.88	10.57
Laptop	345	12.71	12.52
	346	12.88	12.55
	347	12.95	12.63
	348	12.91	12.64
	349	12.81	12.59
Tablet	350	10.74	10.66
	351	10.69	10.64
	352	10.80	10.59
	353	10.81	10.69
	354	10.84	10.70
	355	10.75	10.66
	360	10.42	10.71

A.3.2 The lid is rotating from 360° to 0°

Mode	Angele (degrees)	Measured Power 6GHz 802.11ax160 Ch111 (dBm)	
		Main	Aux.
Tablet	360	10.77	10.84
	350	10.48	10.60
Laptop	340	12.57	12.79
	345	12.55	12.68
Tablet	350	10.51	10.68
Laptop	349	12.58	12.58
	348	12.63	12.63
	347	12.71	12.66
	346	12.56	12.81
	345	12.63	12.71
	340	12.48	12.63
	330	12.60	12.58
	320	12.79	12.72
	310	12.75	12.55
	300	12.64	12.62
	290	12.56	12.44
	280	12.74	12.87
	270	12.62	12.41
	260	12.61	12.81
	250	12.87	12.44
	240	12.52	12.84
	230	12.47	12.66

Mode	Angele (degrees)	Measured Power 6GHz 802.11ax160 Ch111 (dBm)	
		Main	Aux.
Laptop	220	12.64	12.80
	210	12.85	12.87
	200	12.74	12.77
	190	12.49	12.76
	180	12.71	12.55
	170	12.86	12.84
	160	12.78	12.49
	150	12.85	12.56
	140	12.53	12.70
	130	12.85	12.46
	120	12.90	12.51
	110	12.54	12.47
	100	12.90	12.76
	90	12.46	12.64
	80	12.41	12.42
	70	12.46	12.66
	60	12.75	12.69
	50	12.73	12.72
	40	12.49	12.41
	30	12.68	12.82
	20	12.76	12.66
	10	12.42	12.53
	0	12.78	12.60

Statement

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