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CNAS L5785

RF Exposure Evaluation Report

Report No.: CQASZ20260701615E-06
Applicant: Ultimea Technology (Shenzhen) Limited
Address of Applicant: 20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: Soundbar
Model No.: U4320
Test Model No.: U4320
Brand Name: ULTIMEA
FCC ID: 2A900-U4320S
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2026-07-24
Date of Test: 2026-07-24 to 2026-08-25
Date of Issue: 2026-9-20
Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above

Tested By: Azir Wang
(Azir Wang)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack Ai
(Jack Ai)



Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20260701615E-06	Rev.01	Initial report	2026-9-20

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2 General Information

2.1 Client Information

Applicant:	Ultimea Technology (Shenzhen) Limited
Address of Applicant:	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China
Manufacturer:	Ultimea Technology (Shenzhen) Limited
Address of Manufacturer:	20th Floor, Building 4, Tianan Cloud Park, Bantian St., Longgang District, Shenzhen, China
Factory:	SHENZHEN SOUNDJOYFUL TECHNOLOGY CO., LTD
Address of Factory:	Room 905A, Lingyun Building, Xin'an Street, Bao'an, Shenzhen

2.2 General Description of EUT

Product Name:	Soundbar
Model No.:	U4320
Test Model No.:	U4320
Trade Mark:	ULTIMEA
Software Version:	V023
Hardware Version:	V03
EUT Power Supply:	Power by adapter:GQ48-180300-AU Input:100-240V~50/60Hz 1.5A Max Output:18.0V $\overline{=}$ 3.0A

2.3 General Description of BT Classic

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.2
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Module model:	RTL8730ELH
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	FPC antenna
Antenna Gain:	2.79dBi

2.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.2
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK
Number of Channel:	40
Transfer Rate:	1Mbps/2Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Module model:	RTL8730ELH
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	FPC antenna
Antenna Gain:	2.79dBi

2.5 General Description of 2.4G WIFI Classic

Operation Frequency:	IEEE 802.11b/g/n(HT20)/ax(HE20): 2412MHz to 2462MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11ax(HE20): OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20/ax HE20: 11 Channels
Channel Separation:	5MHz
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps
Module model:	RTL8730ELH

Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	FPC antenna
Antenna Gain:	2.79dBi

2.6 General Description of 5G WIFI Classic

Operation Frequency:	IEEE 802.11a/n/ac/ax(20M): 5725MHz ~5850 MHz
Channel Numbers:	IEEE 802.11a/n/ac/ax(20M): 5725MHz ~5850MHz/ 5 channel
Type of Modulation:	IEEE for 802.11a/n/ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11ax: OFDMA(1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Module model:	RTL8730ELH
Sample Type:	☒ Mobile ☐ Portable
Test Software of EUT:	Serial
Antenna Type:	FPC antenna
Antenna gain:	2.81dBi
Cable loss:	1.0 dB

2.7 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.2
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK
Number of Channel:	40
Transfer Rate:	1Mbps/2Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Module model:	KSD5103L
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	FPC antenna
Antenna Gain:	2.79dBi

Note:

The above parameters will directly affect the test results. The information is provided by the applicant.

3 MPE Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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				
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

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

3.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3.1.3 EUT RF Exposure

1) For BLE(RTL8730ELH)

Antenna Gain: 2.79dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.90 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	5.84	6.0±1	7.0	5.01
Middle(2440MHz)	5.40	5.5±1	6.5	4.47
Highest(2480MHz)	4.94	5.0±1	6.0	3.98

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
5.01	2.79	0.0018955233	1.0	PASS

Note: 1) Refer to report No. CQASZ20260701615E-02 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (5.01 * 1.90) / (4 * 3.1416 * 20^2) = 0.0018955233$

2) For BT(RTL8730ELH)

Antenna Gain: 2.79dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.90 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	6.78	7.0±1	8.0	6.31
Middle(2440MHz)	6.53	6.5±1	7.5	5.62
Highest(2480MHz)	6.04	6.0±1	7.0	5.01

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
6.31	2.79	0.0023863225	1.0	PASS

Note: 1) Refer to report No. CQASZ20260701615E-01 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (6.31 * 1.90) / (4 * 3.1416 * 20^2) = 0.0023863225$

3) For 2.4G WIFI(RTL8730ELH)

Antenna Gain: 2.79dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.90 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11AX mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	7.73	8.0±1	9.0	7.94
Middle(2437MHz)	6.91	7.0±1	8.0	6.31
Highest(2462MHz)	5.63	6.0±1	7.0	5.01

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
7.94	2.79	0.0030042020	1.0	PASS

Note: 1) Refer to report No. CQASZ20260701615E-03 for EUT test Max Conducted AV Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (7.94 * 1.90) / (4 * 3.1416 * 20^2) = 0.0030042020$

4) For 5G WIFI Classic(RTL8730ELH)

Antenna Gain: 2.81dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.91 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

11N20 mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(5260MHz)	6.65	7.0±1	8.0	6.31
Middle(5280MHz)	7.14	7.5±1	8.5	7.08
Highest(5320MHz)	7.49	7.5±1	8.5	7.08

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
7.08	2.81	0.0026898566	1.0	PASS

Note: 1) Refer to report No. CQASZ20250100185E-05 for EUT test Max Conducted AV Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (7.08 * 1.91) / (4 * 3.1416 * 20^2) = 0.0026898566$

5) For BLE(KSD5106L)

Antenna Gain: 2.79dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.90 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	4.13	4.5±1	5.5	3.55
Middle(2440MHz)	3.75	4.0±1	5.0	3.16
Highest(2480MHz)	3.26	3.5±1	4.5	2.82

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
3.55	2.50	0.0013419277	1.0	PASS

Note: 1) Refer to report No. CQASZ20260701615E-04 for EUT test Max Conducted Peak Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (2.24 * 1.90) / (4 * 3.1416 * 20^2) = 0.0013419277$

Simultaneous transmission:

MPE ratios(BLE)(KSD5106L)+MPE ratios(2.4G WIFI)(RTL8730ELH)

=0.0013419277/1+0.0030042020/1

=0.00434613≤1

*** END OF REPORT ***