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RF Exposure Evaluation Report

Report No.:	CQASZ20250601413E-04
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.:	U4124, U4125, U4126
Test Model No.:	U4124
Brand Name:	ULTIMEA
FCC ID:	2A9OO-U4124S
Standards:	47 CFR Part 1.1307 47 CFR Part 1.1310 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt:	2025-06-23
Date of Test:	2025-06-23 to 2025-07-16
Date of Issue:	2025-9-10
Test Result:	**PASS***

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

Tested By: lewis zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack Ai
(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20250601413E-04	Rev.01	Initial report	2025-9-10

2 Contents

Page

1 VERSION 2
2 CONTENTS 3
..... 3
3 GENERAL INFORMATION 4
3.1 CLIENT INFORMATION 4
3.2 GENERAL DESCRIPTION OF EUT 4
3.3 GENERAL DESCRIPTION OF BT CLASSIC 5
3.4 GENERAL DESCRIPTION OF BLE 5
3.5 GENERAL DESCRIPTION OF 5.8G SRD 5
4 MPE EVALUATION 6
4.1 RF EXPOSURE COMPLIANCE REQUIREMENT 6
4.1.1 Limits 6
4.1.2 Test Procedure 6
4.1.3 EUT RF Exposure 7

3 General Information

3.1 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:	Zhuhai Fenda Technology Co., Ltd.
Address of Factory:	3/F Building 3, 3/F Building 4, Building 5, 629 Damen Road, Sanzao Town, Jinwan District, Zhuhai City

3.2 General Description of EUT

Product Name:	Soundbar
Model No.:	U4124, U4125, U4126
Test Model No.:	U4124
Trade Mark:	ULTIMEA
Software Version:	V1.0
Hardware Version:	D
Power Supply:	Surround speaker: Model NO.:FX36U-180150C Input:100-240V~ 50/60Hz 0.8A Output:18V⎓ 1.5A(27.0W) Master: MODEL NO.:FX65C-180360Z Input:100-240V~ 50/60Hz 1.5A Output:18V⎓ 3.6A Subwoofer : AC 120V 60Hz

3.3 General Description of BT Classic

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.4
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79
Transfer Rate:	1Mbps/2Mbps/3Mbps
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	PCB antenna
Antenna Gain:	3.45dBi

3.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth Spec 5.4
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
Sample Type:	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type:	PCB antenna
Antenna Gain:	3.45dBi

3.5 General Description of 5.8G SRD

Operation Frequency:	5735MHz~5840MHz
Type of Modulation:	GFSK
Number of Channel:	22
Sample Type:	☒ Mobile ☐ Portable
Antenna Type:	PCB antenna
Antenna Gain:	2.85dBi

Note：

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

4 MPE Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 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: $Pd = (Pout*G)/(4* Pi * R^2)$

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

Pd id 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.

4.1.2 Test Procedure

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

4.1.3 EUT RF Exposure

1) For BLE

Antenna Gain: 3.45dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.213 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)	7.36	7.5±1	8.5	7.08
Middle(2440MHz)	7.74	8.0±1	9.0	7.94
Highest(2480MHz)	8.37	8.5±1	9.5	8.91

The worst case:

Maximum tune-up Power (mW)	**Antenna Gain (dBi)**	**Power Density at R = 20 cm (mW/cm^2)**	**Limit**	**Result**
8.91	3.45	0.0039240012	1.0	PASS

Note: 1) Refer to report No. CQASZ20250100185E-02 for EUT test Max Conducted Peak Output Power value.

2) Pd = (Pout*G)/(4* Pi * R2)=(8.91*2.213)/(4*3.1416*20^2)=0.0039240012

2) For BT

Antenna Gain: 3.45dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.213 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)	6.95	7.0±1	8.0	6.31
Middle(2440MHz)	6.98	7.0±1	8.0	6.31
Highest(2480MHz)	7.90	8.0±1	9.0	7.94

The worst case:

Maximum tune-up Power (mW)	**Antenna Gain (dBi)**	**Power Density at R = 20 cm (mW/cm^2)**	**Limit**	**Result**
7.94	3.45	0.0034972697	1.0	PASS

Note: 1) Refer to report No. CQASZ20250100185E-01 for EUT test Max Conducted Peak Output Power value.

2) Pd = (Pout*G)/(4* Pi * R2)=(7.94*2.213)/(4*3.1416*20^2)=0.0034972697

3) For 5.8G SRD

Antenna Gain: 2.85dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.95 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

$$EIRP = E_{Meas} + 20\log(d_{Meas}) - 104.7$$

where

EIRP	is the equivalent isotropically radiated power, in dBm
E_{Meas}	is the field strength of the emission at the measurement distance, in dBμV/m
d_{Meas}	is the measurement distance, in m

EIRP(Lowest)=90.81+20log(3)-104.7=-4.35dBm
EIRP(Middle)=90.08+20log(3)-104.7=-5.08dBm
EIRP(Highest)=90.95+20log(3)-104.7=-4.21dBm

Measurement Data

GFSK mode					
Test channel	EIRP	Peak Output Power	Tune up tolerance (dBm)	Maximum tune-up Power	
	(dBm)	(dBm)		(dBm)	(mW)
Lowest(2412MHz)	-4.35	-7.2	-7.0±1	-6.0	0.25
Middle(2437MHz)	-5.08	-7.93	-8.0±1	-7.0	0.20
Highest(2462MHz)	-4.21	-7.06	-7.0±1	-6.0	0.25

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm²)	Limit	Result
0.25	2.85	0.0000963228	1.0	PASS

Note: 1) Refer to report No. CQASZ20250100185E-03 for EUT test Max Conducted AV Output Power value.
2) Pd = (Pout*G)/(4* Pi * R2)=(0.25*1.95)/(4*3.1416*20²)=0.0000963228

Simultaneous transmission:
MPE ratios(BT)+MPE ratios(BLE)+MPE ratios(5.8G SRD)
=0.0034972697/1+0.0039240012 /1+0.0000963228 /1
=0.007517594≤1

*** END OF REPORT ***