



SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

EMC-TRF-03 Rev 1.1

Report No.: GZCR240900104602

Page: 1 of 9

FCC ID: SAK-ESP32S3

RF EXPOSURE EVALUATION REPORT

Application No.: GZCR2409001046DS
Applicant: Walter Kidde Portable Equipment Inc.
Address of Applicant: 1016 Corporate Park Drive, Mebane, NC, 27302, USA
Manufacturer: Walter Kidde Portable Equipment Inc.
Address of Manufacturer: 1016 Corporate Park Drive, Mebane, NC, 27302, USA
Factory: Dongguan Fyrnetics Co., Ltd.
Address of Factory: No.1 Rongwen Road, Dongguan Changan, Guangdong, China 523842
Product Name: 2.4 GHz Wi-Fi (802.11 b/g/n) and Bluetooth® 5 (LE) module
Model No.: ESP32-S3-WROOM-1U-N8
Trade Mark: Kidde
Standard(s) : KDB 447498 D01 V06
47 CFR Part 1.1310
Date of Receipt: 2024-09-05
Date of Evaluation: 2024-09-25
Date of Issue: 2024-12-09

Evaluation Result:	Pass*
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* In the configuration evaluated, the EUT complied with the standards specified above.

Ricky Liu

Ricky Liu
Manager



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center EEC Laboratory

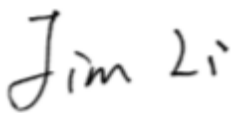
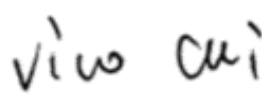
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Revision Record			
Version	Report No.	Date	Remark
01	GZCR240900104602	2024-12-09	Original

Authorized for issue by:			
			
		<div>Jim Li/Project Engineer</div>	
			
		<div>Vico Cui/Reviewer</div>	

2 Evaluation Summary

Item	Standard	Method	Requirement	Result
RF Exposure	KDB 447498 D01 V06	KDB 447498 D01 V06	47 CFR Part 1.1310	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.3 V
Cable(s):	DC input ports
Antenna Type:	Flex-PIFA Antenna
Antenna Gain:	4.4 dBi according to antenna specification
Antenna Number:	1
For BLE	
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
For 2.4GHz Wi-Fi	
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7
Channel Spacing:	5MHz

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Evaluating Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou,
Guangdong, China 510663

Tel: +86 20 82155555

No tests were sub-contracted.



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4.3 Facility

The facility is recognized, certified, or accredited by the following organizations:

● ACMA

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

● SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● FCC Recognized Accredited Test Firm(Registration No.: 486818)

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

● ISED (Registration No.: 4620B, CAB identifier: CN0052)

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

● CBTL (Lab Code: TL129)

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.4 Deviation from Standards

None

4.5 Abnormalities from Standard Conditions

None



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5 Technical Requirements Specification

5.1 General Description of Applied Standards

KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

5.2 RF Exposure Evaluation

5.2.1 Limit & Test Method

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: $P_d = (P_{out} * G) / (4 * P_i * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

P_i = 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.



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5.2.2 Conclusion

Normal use condition for
Distance between antenna and body: 20cm declared by applicant

For Bluetooth BLE

Antenna Gain: 4.4 dBi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2402	2.754228703	1.63	1.46	0.00080	1	Complies
2440	2.754228703	1.84	1.53	0.00084	1	Complies
2480	2.754228703	2.2	1.66	0.00091	1	Complies

For 2.4 GHz Wi-Fi

Antenna Gain: 4.4 dBi

Frequency (MHz)	Antenna Gain (Numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
11B						
2412	2.754228703	15.2	33.11	0.01814	1	Complies
2437	2.754228703	14.52	28.31	0.01551	1	Complies
2462	2.754228703	14.2	26.30	0.01441	1	Complies
11G						
2412	2.754228703	18.44	69.82	0.03826	1	Complies
2437	2.754228703	18.97	78.89	0.04322	1	Complies
2462	2.754228703	18.91	77.80	0.04263	1	Complies
11N40						
2422	2.754228703	16.82	48.08	0.02635	1	Complies
2437	2.754228703	16.84	48.31	0.02647	1	Complies
2452	2.754228703	17.07	50.93	0.02791	1	Complies

The Bluetooth and Wi-Fi can be transmitted together, the result is

0.00091 /1+

0.04322 /1=

0.04413 <1

So SAR report is not required.

Note: Refer to report No. GZCR240900104601 for EUT test Max Conducted Peak Output Power value.

6 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2409001046DS

- End of the Report -



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