

RF Exposure Evaluation Report

Client: Fireboard Labs LLC

Address: 501 Charlotte St
Kansas City, MO 64106

EUT: FBXDC

Test Report No.: R20260105-81-M1A

Approved By: 
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iNARTE EMC-50662-E

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Total Pages: 8

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Revision Page

Rev. No.	Date	Description
0	8 May 2026	Issued by BWinter Reviewed by FLane Prepared by BWinter
A	8 May 2026	Revision A – BWinter 1. Add duty cycle to calculations

1 Regulatory Requirements:

FCC Part 1.1310, 2.1091, 2.1093
RSS-102, Issue 6
KDB 447498 D01

Summary:

The purpose of this report is to evaluate the EUT's transmitter for exemption from routine SAR testing.

EUT:

Model:	FBXDC
FCC ID:	2A29A-FBXDC
IC:	27842-FBXDC
HVIN:	FBXDC

BLE/WiFi Module:

Model:	ESP32-S3-WROOM-1
FCC ID:	2AC7Z-ESPS3WROOM1
IC ID:	21098-ESPS3WROOM1
REL date:	2024-09-01

MPE Lab	Nebraska Center for Excellence in Electronics
MPE Labs FCC Cab Designation:	US1060
MPE Labs ISED Cab Designation:	US0177
FCC Lab Registration Number:	134067

2 FCC Limits, Part 1.1310

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 Exposure				
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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

Calculations:

The applicant states that none of the RF transmitters in this device operate simultaneously with any other RF transmitters in the device. The WiFi transmitter has the highest power output, so calculations were performed on the WiFi transmitter.

The maximum time-averaged power of the source in this device is less than 1mW per 1.1307(b)(3)(i)(A).

EUT

FCC maximum time-averaged power Calculations					
Freq.	Peak Power EIRP	On time per cycle	Cycle Time	Average Power	Result
MHz	mW	Seconds	Seconds	mW	
2402-2483.5	100	.045	5	0.90	PASS

Result:

The EUT was found to be exempt from routine SAR testing and **COMPLIANT** with RF exposure requirements.

Result:
Complies

3 ISED RSS 102, Issue 6, Section 6.4

Devices operating at or below the applicable output power levels (adjusted for tune-up tolerance) specified in table 11, based on the separation distance, are exempt from SAR evaluation. The separation distance, defined as the distance between the user and/or bystander and the antenna and/or radiating element of the device or the outer surface of the device, shall be less than or equal to 20 cm for these exemption limits to apply.

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

Frequency (MHz)	≤ 5 mm(mW)	10 mm (mW)	15 mm(mW)	20 mm(mW)	25 mm(mW)	30 mm(mW)	35 mm(mW)	40 mm(mW)	45 mm(mW)	> 50 mm(mW)
≤ 300	45	116	139	163	189	216	246	280	319	362
450	32	71	87	104	124	147	175	208	248	296
835	21	32	41	54	72	96	129	172	228	298
1900	6	10	18	33	57	92	138	194	257	323
2450	3	7	16	32	56	89	128	170	209	245
3500	2	6	15	29	50	72	94	114	134	158
5800	1	5	13	23	32	41	54	74	102	128

The exemption limits in table 11 are based on measurements and simulations of half-wave dipole antennas at separation distances of 5 mm to 50 mm from a flat phantom, which provides a SAR value of approximately 0.4 W/kg for 1 g of tissue.

For limb-worn devices where the 10 gram of tissue applies, the exemption limits for routine evaluation in table 11 are multiplied by a factor of 2.5.

For controlled-use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in table 11 are multiplied by a factor of 5.

When the operating frequency of the device is between two frequencies located in table 11, linear interpolation shall be applied for the applicable separation distance. If the separation distance of the device is between two distances located in table 11, linear interpolation may be applied for the applicable frequency. Alternatively, the limit corresponding to the smaller distance may be employed. For example, in case of a 7 mm separation distance, either use the exception value for a 5 mm separation distance or interpolate between the limits corresponding to 5 mm and 10 mm separation distances.

For implanted medical devices, the exemption limit for routine SAR evaluation is set at an output power of 1 mW, regardless of frequency.

The SAR levels from exempted transmitters shall be included in the compliance assessment and the determination of the TER. Detailed guidance is included in sections 7.1.8 and 8.2.2.1.

Calculations:

The maximum time-averaged power of the source in this device is less than 1mW per Section 6.4.

EUT

Maximum time-averaged power calculations						
Freq.	Peak Power	On time per cycle	Cycle Time	Average Power	Exemption Limit	Result
MHz	mW	Seconds	Seconds	mW	mW	
2400-2483.5	100	0.045	5	0.90	1	PASS

*Average Power = (Peak Power) * (On time per cycle) / (Cycle Time)

Result:

The EUT was found to be exempt from routine SAR testing and COMPLIANT with RF exposure exemption requirements.

Result:

Complies

REPORT END