1. RF Exposure Requirements

1.1 General Information

Client Information

Applicant:	EcoFlow Inc.
Address of applicant:	RM 401, Plant #l, Runheng Industrial Zone, Fuhai Street, Bao'an District, Shenzhen, 518000 China
Manufacturer:	EcoFlow Inc.
Address of manufacturer:	RM 401, Plant #l, Runheng Industrial Zone, Fuhai Street, Bao'an District, Shenzhen, 518000 China

General Description of EUT:

Product Name:	EcoFlow Smart Generator 3000 (Dual Fuel)
Trade Name	ECOFLOW; EF ECOFLOW
Model No.:	EF-SG-H03-1
Adding Model(s):	/
Rated Voltage:	Battery DC12.8V; Output AC120V
Battery Capacity:	1500mAh
Power Adapter:	/
FCC ID:	2A2P9-PGGE307
Equipment Type:	Mobile device

Technical Characteristics of EUT:

Bluetooth

Bluetooth Version:	V5.1 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	Onboard PCB antenna: 1Mbps:5.77dBm (Conducted)
	2Mbps: 5.68dBm (Conducted)
	External PCB antenna: 1Mbps:7.49dBm (Conducted)
	2Mbps: 7.86dBm (Conducted)
Data Rate:	1Mbps, 2Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	Onboard PCB antenna:2.89dBi
	External PCB antenna:4.06dBi

Wi-Fi

Support Standards:	802.11b, 802.11g, 802.11n, 802.11ax
Frequency Range:	2412-2462MHz for 802.11b/g/n/ax(HT/HE20)
	2422-2452MHz for 802.11n(HT40)
RF Output Power:	Onboard PCB antenna:18.38dBm (Conducted)

	External PCB antenna:17.18dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM, 256QAM,1024QAM
Quantity of Channels:	11 for 802.11b/g/n/ax(HT/HE20); 7 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	Onboard PCB antenna:2.89dBi
	External PCB antenna:4.06dBi

1.2 RF Exposure Exemption

According to §1.1307(b)(3) and KDB 447498 D04 Interim General RF Exposure Guidance v01, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

Option A: FCC Rule Part 1.1307 (b)(3)(i)(A):The available maximum time-averaged power is no more than 1mW, regardless of separation distance.

Option B: FCC Rule Part 1.1307 (b)(3)(i)(B): The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20\ cm}(d/20\ cm)^x & d \le 20\ cm \\ ERP_{20\ cm} & 20\ cm < d \le 40\ cm \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm} \text{ (mW)} = \begin{cases} 2040f & 0.3\ GHz \le f < 1.5\ GHz \\ 3060 & 1.5\ GHz \le f \le 6\ GHz \end{cases}$$

d = the separation distance (cm);

Option C: FCC Rule Part 1.1307 (b)(3)(i)(C): The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. R must be at least λ/2π, where λ is the free-space operating wavelength in meters.

Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2
1.34-30	3,450 R^2/f^2
30-300	3.83 R^2
300-1,500	0.0128 R^2f
1,500-100,000	19.2R^2

For Multiple RF sources: FCC Rule Part 1.1307(b)(3)(ii):

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required).

(B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

1.3 Calculated Result

Radio Access Technology	Prediction Frequency (MHz)	Output Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	Tune-Up Time-Averaged Power (dBm)	ERP (dBm)
Onboard PCB antenna	2402	5.77	2.89	100	6.00	6.74
External PCB antenna	2402	7.86	4.06	100	8.00	9.91
Onboard PCB antenna	2412	18.38	2.89	100	19.00	19.74
External PCB antenna	2412	17.18	4.06	100	18.00	19.91

| Frequency | Option | Min. Distance | Max. Power | | Exposure Limit | Ratio | Result |
(MHz)		(cm)	(dBm)	(mW)	(mW)		Pass/Fail
2402	C	20.00	6.74	4.72	768.00	0.01	Pass
2402	C	20.00	9.91	9.79	768.00	0.01	Pass
2412	C	20.00	19.74	94.19	768.00	0.12	Pass
2412	C	20.00	19.91	97.95	768.00	0.13	Pass

Note: 1. Time-Averaged Power=Output Power * Duty Cycle; ERP= Time-Averaged Power+ Antenna gain-2.15dB

2. Option A, B and C refers as clause 1.2.

3. For option B, Max (time-averaged power, effective radiated power (ERP)) converts to Max. Power. For option C, ERP converts to Max. Power;

4. For option B, P_{th} (mW) converts to Exposure Limit (mW); For option C, ERP (W) converts to Exposure Limit (mW).

5. Ratio= Tune-Up ERP (mW)/ Exposure Limit (mW)

Mode for Simultaneous Multi-band Transmission:

| Radio Access Technology | Ratio 1 | Ratio 2 | Simultaneous Ratio | Limit | Result |
					Pass/Fail
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Note: The radio equipment can't transmit on multiple antennas simultaneously in the same band.

Result: Pass