FCC 47 CFR MPE REPORT

Snap One, LLC

Class D Mixer-Amplifier with Bluetooth

Model Number: ECA-70MIXAMP-1-240D

Additional Model: ECA-70MIXAMP-1-120D

FCC ID: 2AJAC-ECA70MIXAMP

Applicant:	Snap One, LLC
Address:	1800 Continental Blvd., Suite 200 Charlotte, NC 28273,USA
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
Tel: 86-769-83081888-808	

Report Number:	ESTE-R2306110
Date of Test:	Jun. 15~21, 2023
Date of Report:	Jun. 25, 2023

Maximum Permissible Exposure

1. Applicable Standards

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

1.1. Limits for Maximum Permissible Exposure (MPE)

(a) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\lvert E \rvert^2$, $\lvert H \rvert^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-10000			5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Times $\lvert E \rvert^2$, $\lvert H \rvert^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-10000			1.o	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

1.2. MPE Calculation Method

$$E \ (V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: Pd (W/m}^2) = \frac{E^2}{377}$$

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

2. Conducted Power Result

Mode	Frequency (MHz)	Peak output power (dBm)	Peak output power (mW)
GFSK	2402	9.05	8.035
	2441	6.49	4.457
	2480	3.48	2.228
π/4-DQPSK	2402	9.01	7.962
	2441	6.49	4.457
	2480	3.48	2.228
8-DPSK	2402	9.02	7.980
	2441	6.51	4.477
	2480	3.50	2.239
BLE 1M	2402	8.84	7.656
	2440	6.38	4.345
	2480	3.13	2.056

3. Calculated Result and Limit

Mode	Peak output power (dBm)	Target power (dBm)	MAX Target power (dBm)	Antenna gain (dBi)	Antenna gain (Linear)	Power Density (S) (mW/cm^2)	Limited of Power Density (S) (mW/cm^2)	Test Result
GFSK	9.05	9±1	10	3	1.995	0.00397	1	Complies
π/4-DQPSK	9.01	9±1	10	3	1.995	0.00397	1	Complies
8-DPSK	9.02	9±1	10	3	1.995	0.00397	1	Complies
BLE 1M	8.84	8±1	9	3	1.995	0.00315	1	Complies

End of Test Report