# FCC 47 CFR MPE REPORT

Snap One, LLC

ACI Snap One soundbar

Model Number: Soundbar

FCC ID: 2AJAC-180BLK

| Prepared for: | Snap One, LLC |
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|---|---|
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## 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 $\mid E \mid^2$, $\mid H \mid^2$ 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 $\mid E \mid^2$, $\mid H \mid^2$ 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) | Target power (dBm) | Antenna gain | |
|---|---|---|---|---|---|---|
| | | | | | (dBi) | (Linear) |
| GFSK | 2402 | 3.52 | 2.249 | 3±1 | 0 | 1 |
| | 2441 | 3.42 | 2.198 | 3±1 | 0 | 1 |
| | 2480 | 3.07 | 2.028 | 3±1 | 0 | 1 |
| 8-DPSK | 2402 | 3.74 | 2.366 | 3±1 | 0 | 1 |
| | 2441 | 3.62 | 2.301 | 3±1 | 0 | 1 |
| | 2480 | 3.30 | 2.138 | 3±1 | 0 | 1 |
| BLE GFSK 1M | 2402 | 3.70 | 2.344 | 3±1 | 0 | 1 |
| | 2440 | 3.55 | 2.265 | 3±1 | 0 | 1 |
| | 2480 | 3.12 | 2.051 | 3±1 | 0 | 1 |
| BLE GFSK 2M | 2402 | 3.89 | 2.449 | 3±1 | 0 | 1 |
| | 2440 | 3.64 | 2.312 | 3±1 | 0 | 1 |
| | 2480 | 3.21 | 2.094 | 3±1 | 0 | 1 |

# 3. Calculated Result and Limit

| Mode | Target power (dBm) | Antenna gain | | Power Density (S) (mW/cm$^2$) | Limited of Power Density (S) (mW/cm$^2$) | Test Result |
|---|---|---|---|---|---|---|
| | | (dBi) | (Linear) | | | |
| 2.4G Band | | | | | | |
| GFSK | 4 | 0 | 1 | 0.0005 | 1 | Complies |
| 8-DPSK | 4 | 0 | 1 | 0.0005 | 1 | Complies |
| BLE GFSK 1M | 4 | 0 | 1 | 0.0005 | 1 | Complies |
| BLE GFSK 2M | 4 | 0 | 1 | 0.0005 | 1 | Complies |

For 2.4G SRD

Ant gain= -4.50dBi

Ant numeric gain= 0.3548

Field strength = 90.81 dBuV/m@3m

$P=\{ [10^{(90.81/20)}/10^6 *3]^2/ (30*0.3548) \}*1000mW = 1.0189mW$

$Pd= (30*1.0189*0.3548) / (377*20^2)=0.00007 < 1$

**End of Test Report**