

# 1 Safety Human Exposure

## 1.1 Radio Frequency Exposure Compliance

### 1.1.1 Electromagnetic Fields

RESULT:

Pass

Report No. : CN235XNB 003  
Test Specification  
Test item : 2.1 Channel Soundbar with Wireless Subwoofer  
Identification / Type No. : NS-HTSB2123, NS-HTSB2123-C  
Note: model name different only.  
FCC ID : 2AJAA-SB2123  
IC: 21761-SB2123  
HVIN : SOUNDBAR\_UNIT  
Test standard : CFR47 FCC Part 2: Section 2.1091  
CFR47 FCC Part 1: Section 1.1310  
FCC KDB Publication 447498 D01 v06  
RSS-102 Issue 5 February 2021

#### 1.1.1.1 RF Exposure Compliance Requirement for FCC

**FCC requirement:** 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 20cm normally can be maintained between the user and the device.

#### ➤ Radio Frequency Exposure Limit

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

| Frequency range (MHz)                                   | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | 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 <sup>2</sup> )              | 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 <sup>2</sup> )              | 30                       |
| 30-300                                                  | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1500                                                |                               |                               | f/1500                              | 30                       |
| 1500-100,000                                            |                               |                               | 1.0                                 | 30                       |

➤ **Radio Frequency Exposure Calculation Formula**

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)  
P = power input to the antenna (in appropriate units, e.g., mW)  
G = power gain of the antenna in the direction of interest relative to an isotropic radiator  
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

**or:**

$$S = \frac{EIRP}{4\pi R^2}$$

where: EIRP = equivalent (or effective) isotropically radiated power

**Table 1: Test Results of RF Exposure Calculations for FCC, stand-alone mode**

| Mode                                                    | *Measured RF Output Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Verdict |
|---------------------------------------------------------|---------------------------------|--------------------|---------------|-------------------------------------|-----------------------------|---------|
| *Bluetooth                                              | 8.36                            | 0.5                | 20            | 0.0015                              | 1.0                         | Pass    |
| Note: *Bluetooth RF Output Power: Refer to CN235XNB 002 |                                 |                    |               |                                     |                             |         |

### 1.1.1.2 RF Exposure Compliance Requirement for IC

The EUT shall comply with the requirement of RSS-102 section 2.5.2.

**Exemption from Routine Evaluation Limits – RF Exposure Evaluation**

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than  $1.31 \times 10^{-2} f^{0.6834}$  W (adjusted for tune-up tolerance), where  $f$  is in MHz;

**Table 2: Test Results of RF Exposure Calculations for ISED, Stand-alone mode**

| Operating Mode                                          | Max. EIRP incl. tune-up (dBm) | Distance (cm) | Maximum EIRP (W) | Threshold power (W) | Verdict |
|---------------------------------------------------------|-------------------------------|---------------|------------------|---------------------|---------|
| *Bluetooth                                              | 8.86                          | 20            | 0.0077           | 2.68                | Pass    |
| Note: *Bluetooth RF Output Power: Refer to CN235XNB 002 |                               |               |                  |                     |         |

➤ **Conclusion**

Therefore the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.

**“RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”**