RF Exposure

The equipment under test (EUT) is a 36 inch 5.1 Soundbar With Wireless Subwoofer with Bluetooth 5.0 (Single Mode EDR) function operating in 2402-2480MHz and 5.8G SRD function operation in 5727-5848MHz. The EUT is powered by 100-240V~ 60Hz. For more detail information pls. refer to the user manual.

Standalone evaluation
Bluetooth Version: 5.0 EDR
Antenna Type: Integral antenna.
Antenna Gain: 1dBi.
Modulation Type: GFSK, π/4DQPSK, 8DPSK.
The nominal conducted output power specified: 3dBm (+/-3dB).
The nominal radiated output power (e.i.r.p) specified: 4dBm (+/- 3dB).

The maximun peak radiated emission for the EUT is 102.1dBμV/m at 3m in the frequency 2402MHz
The EIRP = [(FS*D) ^2 / 30] mW = 6.87dBm
which is within the production variation.

The minimum peak radiated emission for the EUT is 98.2dBμV/m at 3m in the frequency 2480MHz
The EIRP = [(FS*D) ^2 / 30] mW = 2.97dBm
which is within the production variation.

According to FCC Part 2.1091, this unlicensed transmitting devices is categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use, According to the KDB 447498 and OET 65, the simple calculation as below:

The source-based time averaged maximum radiated power = 7dBm = 5.01mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 2.4GHz band can be calculated according to OET 65 as follow:
= 5.01mW/ 4πR^2
= 0.001 mW/cm^2
<1mW/cm^2

The MPE limit is 1.0 mW/cm^2 for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1310. As the measured power density at 20cm from the transmitter is lower than the MPE limit, the compliance to the MPE limit can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structure and body of the user or nearby persons.

5.8G SRD:
Antenna Type: Integral antenna.
Antenna Gain: 1dBi.
Modulation Type: 8DPSK
The nominal conducted output power specified: 1dBm (+/-3dB).
The nominal radiated output power (e.i.r.p) specified: 2dBm (+/- 3dB).

The maximun peak radiated emission for the EUT is 99.8dBμV/m at 3m in the frequency 5788MHz
The EIRP = [(FS*D) ^2 / 30] mW = 4.57dBm
which is within the production variation.

The minimum peak radiated emission for the EUT is 96.1dBμV/m at 3m in the frequency 5848MHz
The EIRP = [(FS*D) ^2 / 30] mW = 0.87dBm
which is within the production variation.

According to FCC Part 2.1091, this unlicensed transmitting devices is categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use, According to the KDB 447498 and OET 65, the simple calculation as below:

The source-based time averaged maximum radiated power = 5dBm = 3.16mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 2.4GHz band can be calculated according to OET 65 as follow:
= 3.16mW/ 4πR^2
= 0.00063 mW/cm^2
<1mW/cm^2

The MPE limit is 1.0 mW/cm^2 for general population and uncontrolled exposure in the 5.8GHz frequency range according to FCC Part 1.1310. As the measured power density at 20cm from the transmitter is lower than the MPE limit, the compliance to the MPE limit can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structure and body of the user or nearby persons.

Simultaneous Transmission Evaluation

For Simultaneous transmitting of Bluetooth and 5.8G SRD, According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits = 0.001/1 + 0.00063/1 = 0.00163< 1

Since the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in the device is ≤ 1.0, the EUT is considered to satisfy MPE compliance for simultaneous transmission operations.

The following RF exposure statement or similar sentence is proposed to be included in the user manual:

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