RF Exposure

The equipment under test (EUT) is a 3 Dolby Atmos Sound Bar System with Wireless Subwoofer with Bluetooth function operating in 2402-2480MHz and 5.8G Transmitter function operating in 5727-5819MHz. The EUT is powered by AC 100-240V~ 50/60Hz. For more detailed features description, please refer to the user's manual.

Standalone SAR evaluation for BT function

Bluetooth Version: 5.1 EDR
Antenna Type: Integral antenna
Antenna Gain: 2.67 dBi max
Modulation Type: GFSK, $\pi/4$ –DQPSK

The nominal conducted output power specified: 3dBm (+/-2dB).
The nominal radiated output power (e.i.r.p) specified: 5.67dBm (+/- 2dB).

The maximum conducted output power for the EUT is 4.65dBm in the frequency 2480MHz which is within the production variation.

The minimum conducted output power for the EUT is 4.26dBm in the frequency 2402MHz 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 = 5.67dBm+2dB
= 7.67dBm = 5.848mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 2.4GHz BT band can be calculated according to OET 65 as follow:
= 5.848mW/ 4πR^2
= 0.001mW/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.

Standalone SAR evaluation for 5.8GHz transmitter

5.8GHz transmitter:
Antenna Type: Integral Antenna.
Antenna Gain: 2.0 dBi.
Modulation Type: FSK.

The nominal conducted output power specified: -2dBm (+/-2dB).
The nominal radiated output power (e.i.r.p) specified: 0dBm (+/- 2dB).

The maximum conducted output power for the EUT is -1.0dBm in the frequency 5819MHz which is within the production variation.

The minimum conducted output power for the EUT is -2.41dBm in the frequency 5727MHz 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 = 0dBm+2dB
= 2dBm = 1.585mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna for 5.8GHz band can be calculated according to OET 65 as follow:
= 1.585mW/ 4πR^2
= 0.0003 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.

Simultaneous Transmission SAR Evaluation

For Simultaneous transmitting of Bluetooth and 5.8GHz transmitter, 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 + 0.0003/1 = 0.0013< 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.”