

## INTERTEK TESTING SERVICES

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### RF Exposure

The equipment under test (EUT) is a 5.1 CH Soundbar with Wireless Subwoofer, 3.1 CH Soundbar with Wireless Subwoofer with Bluetooth 5.3 EDR (Single Mode) function operating in 2402-2480MHz and 5.8GHz function operating in 5729-5849MHz. The EUT is powered by AC 100-240V, 50/60Hz. For more detail information pls. refer to the user manual.

Bluetooth Version: 5.3 EDR

Antenna Type: Integral antenna

Antenna Gain: 4.14 dBi max

Modulation Type: GFSK, p/4 –DQPSK

The nominal conducted output power specified: 3.86dBm (+/-2dB).

The nominal radiated output power (e.i.r.p) specified: 8dBm (+/- 2dB).

According to the KDB 447498 V07:

The maximum peak radiated emission for the EUT is 103.9dBμV/m at 3m in the frequency 2402MHz

The EIRP =  $[(FS \cdot D)^2 / 30]$  mW = 8.7dBm

which is within the production variation.

The minimum peak radiated emission for the EUT is 102.7dBμV/m at 3m in the frequency 2480MHz

The EIRP =  $[(FS \cdot D)^2 / 30]$  mW = 7.5dBm

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 V07 and OET 65, the simple calculation as below:

The source-based time averaged maximum radiated power = 8dBm+2dB= 10dBm = 10mW

At the distance (R) of 20cm to 40cm and in 0.3 GHz to 6 GHz, MPE Exclusion Threshold Level:

$$P_{th} (mW) = ERP_{20\text{ cm}} (mW) = \begin{cases} 2040f & 0.3\text{ GHz} \leq f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \leq f \leq 6\text{ GHz} \end{cases}$$

The MPE limit is 3060mW for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1307. 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.

Note: EIRP is higher than ERP, thus EIRP is compared with the Exclusion Threshold.

## 5.8G function:

Antenna Type: Integral antenna

Antenna Gain: 0.26 dBi max

Modulation Type: GFSK

The nominal conducted output power specified: -1.26dBm (+/-2dB).

The nominal radiated output power (e.i.r.p) specified: -1dBm (+/- 2dB).

According to the KDB 447498 V07:

The maximum peak radiated emission for the EUT is 94dBμV/m at 3m in the frequency 5849MHz

The EIRP =  $[(FS \cdot D)^2 / 30]$  mW = -1.2dBm  
which is within the production variation.

The minimum peak radiated emission for the EUT is 93.1dBμV/m at 3m in the frequency 5789MHz

The EIRP =  $[(FS \cdot D)^2 / 30]$  mW = -2.1dBm  
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 V07 and OET 65, the simple calculation as below:

The source-based time averaged maximum radiated power = -1dBm+2dB= 1dBm = 1.26mW

At the distance (R) of 20cm to 40cm and in 0.3 GHz to 6 GHz, MPE Exclusion Threshold Level:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

The MPE limit is 3060mW for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1307. 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.

Note: EIRP is higher than ERP, thus EIRP is compared with the Exclusion Threshold.

## Simultaneous Transmission MPE

For Simultaneous transmitting of Bluetooth EDR and 5.8G function, According to KDB 447498 V07 2.2.2:

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits =  $10/3060 + 1.26/3060 = 0.00368 < 1$

Since the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in the device is  $\leq 1.0$ , 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.”

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