Analysis Report

The equipment under test (EUT) is a 2.1 soundbar with wireless subwoofer with BT function operating in 2402-2480MHz, and 2.4GHz wireless data transmission function operating in 2404.5-2479.5MHz with channel separation 5MHz (number of channel 16). The EUT is powered by AC 120V, 60Hz. For more detail information pls. refer to the user manual.

For BT3.0, 2.1+EDR
Modulation Type: GFSK, π/4DQPSK, 8DPSK
Antenna Type: Integral antenna
Antenna Gain: 0dBi
The nominal conducted output power specified: -5dBm (Tolerance: +/- 3dB)
The nominal radiated output power (e.i.r.p) specified: -5dBm (Tolerance: +/- 3dB)

According to the KDB 447498:

The maximum radiated emission for the EUT is 91.1dBμV/m at 3m in the frequency 2.402GHz
= [(FS*D) ^2 / 30] mW
= -4.1dBm which is within the production variation.

The minimum radiated emission for the EUT is 89.3dBμV/m at 3m in the frequency 2.480GHz
= [(FS*D) ^2 / 30] mW
= -6.0dBm which is within the production variation.

The maximum conducted output power specified is -2.0dBm = 0.63mW
The source- based time-averaging conducted output power
= 0.63 * Duty cycle mW= 0.63 mW (Duty Cycle<=100%)

The SAR Exclusion Threshold Level:
= 3.0 * (min. test separation distance, mm) / sqrt(freq. in GHz)
= 3.0 * 5 / sqrt (2.480) mW
= 9.5 mW

Since the source-based time-averaging conducted output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

For 2.4GHz wireless transmitter function operating frequency is
2404.5-2479.5MHz
Modulation Type: FSK
Antenna Type: Integral antenna
Antenna Gain: 0dBi
The nominal conducted output power specified: -5dBm (Tolerance: +/- 3dB)
The nominal radiated output power (e.i.r.p) specified: -5dBm (Tolerance: +/- 3dB)

According to the KDB 447498:

The maximum radiated emission for the EUT is 90.3dBμV/m at 3m in the frequency 2479.5MHz
= [(FS*D) ^2 / 30] mW
= -5.0dBm which is within the production variation.

The minimum radiated emission for the EUT is 88.6dBμV/m at 3m in the frequency 2404.5MHz
= [(FS*D) ^2 / 30] mW
= -6.6dBm which is within the production variation.

The maximum conducted output power specified is -2.0dBm = 0.63mW
The source- based time-averaging conducted output power
= 0.63 * Duty cycle mW= 0.63 mW

The SAR Exclusion Threshold Level:
= 3.0 * (min. test separation distance, mm) / sqrt(freq. in GHz)
= 3.0 * 5 / sqrt (2.4795) mW
= 9.5 mW

Since the source-based time-averaging conducted output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

Transmitter Duty Cycle Calculation

The EUT transmit continuously during the test, the duty cycle is 100%.

.

When both Bluetooth and 2.4GHz transmitter transmitted simultaneously, the maximun conducted output power for BT and 2.4GHz transmitter is -2dBm. respectively.

In the simultaneous transmissions, Bluetooth's estimated SAR values:
= (max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm) * [sqrt(freq. in GHz)/7.5] W/kg
= 0.63 / 5*[sqrt (2.480) / 7.5] W/kg
= 0.03 W/kg

In the simultaneous transmissions, 2.4GHz wireless data transmitter estimated SAR values:
= (max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm) * [sqrt(freq. in GHz)/7.5] W/kg
= 0.63 / 5*[sqrt (2.4795) / 7.5] W/kg
= 0.03 W/kg

Sum of 1-g SAR of all simultaneous transmitting antennas in an operating mode:
Bluetooth estimated SAR values + 2.4GHz wireless data transmitter estimated SAR values
= 0.03 W/kg + 0.03 W/kg
= 0.06 W/kg

The simultaneous transmissions SAR Evaluation: ≤ 0.4 W/kg

This requirement is according to KDB 865664 D02.