

Analysis Report

The Equipment Under Test (EUT) is Batband (wireless headphone with 2.4GHz Bluetooth) that exhibits Bluetooth 4.0 BLE and Bluetooth 3.0 features. The EUT can accept wireless audio signal via external Bluetooth mobile device after pairing (such as smartphone). The EUT is powered by 3.7VDC internal rechargeable battery and/or USB port (5VDC). When the EUT is charging via USB port, the EUT has no RF emission.

Bluetooth portion:

For Bluetooth 4.0 BLE mode, it occupies a frequency range from 2402MHz to 2480MHz (40 channels with channel spacing of 2MHz). It transmits via GFSK modulation.

For Bluetooth 3.0 mode, it occupies a frequency range from 2402MHz to 2480MHz (79 channels with channel spacing of 1MHz). It transmits via GFSK modulation.

Antenna Type: Internal, Integral

Antenna Gain: 2.5dBi

Operating mode	Nominal Radiated Field Strength	Production Tolerance	Modulation Type
Bluetooth 3.0	94.6 dB μ V/m at 3m	+/- 3dB	GFSK
Bluetooth 4.0 BLE	93.6 dB μ V/m at 3m	+/- 3dB	GFSK

According to the KDB 447498:

For Bluetooth 3.0:

Based on the Maximum allowed field strength of production tolerance was 97.6 dB μ V/m at 3m in frequency 2.480GHz, thus;

$$\text{The EIRP} = [(FS^2 * D) / 30] = 1.73 \text{ mW}$$

Conducted power = Radiated Power (EIRP) – Antenna Gain

So;

Conducted Power = 0.97 mW.

The SAR Exclusion Threshold Level:

$$= 3.0 * (\text{min. test separation distance, mm}) / \sqrt{\text{freq. in GHz}}$$

$$= 3.0 * 5 / \sqrt{2.480} \text{ mW}$$

$$= 9.53 \text{ mW}$$

For Bluetooth 4.0 BLE:

Based on the Maximum allowed field strength of production tolerance was 96.6 dB μ V/m at 3m in frequency 2.480GHz, thus;

$$\text{The EIRP} = [(FS^*D)^2 * 1000 / 30] = 1.37 \text{ mW}$$

Conducted power = Radiated Power (EIRP) – Antenna Gain

So;

$$\text{Conducted Power} = 0.77 \text{ mW.}$$

The SAR Exclusion Threshold Level:

$$= 3.0 * (\text{min. test separation distance, mm}) / \text{sqrt(freq. in GHz)}$$

$$= 3.0 * 5 / \text{sqrt}(2.480) \text{ mW}$$

$$= 9.53 \text{ mW}$$

Since the above conducted output power is well below the SAR Exclusion threshold level, so the EUT is considered to comply with SAR requirement without testing.