

MPE Analysis Report

The Equipment Under Test (EUT) is a Bluetooth Hi Fi Music System with Light Effects, also equipped with microphone input, FM/AM tuner, AUX-in, CD, USB flash memory playback and Video output. It can be paired with Bluetooth audio device for wireless audio playing. For Bluetooth, the EUT occupies a frequency range from 2402MHz to 2480MHz (79 channels with channel spacing of 1MHz). The EUT is powered by 120VAC only. The NFC tag is a passive device which is powered by external RF field.

2.4GHz Bluetooth Module:

Antenna Type: Integral, Internal

Antenna gain: 0dBi

Operating mode	Nominal Radiated Field Strength	Production Tolerance	Modulation Type
Bluetooth 3.0	90.8 dB μ V/m at 3m	+3/-3dB	GFSK

For Maximum Permissible Exposure (MPE) evaluation, the maximum power density at 20 cm from this mobile transmitter shall be less than the General Population / Uncontrolled MPE limit in OET Bulletin 65.

The maximum field strength measured (FS) was 93.8dB μ V/m. The distance (D) between the antenna and the equipment under test (EUT) was 3 meters. And the maximum source-based time-averaging duty factor is 100%. From these data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna can be calculated according to OET Bulletin 65 as follow:

$$\text{The radiated power} = (\text{FS} \cdot \text{D})^2 / 30 = 0.72 \text{ mW}$$

$$\begin{aligned} \text{The radiated (EIRP) source-based time-averaging output power} \\ &= (0.72 * 1) \text{ mW} \\ &= 0.72 \text{ mW} \end{aligned}$$

$$\begin{aligned} \text{The power density at 20 cm from the antenna} \\ &= \text{EIRP} / 4\pi\text{R}^2 \\ &= 0.000143 \text{ mW cm}^{-2} \end{aligned}$$

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In the frequency range of 1,500 - 100,000MHz, the MPE limit is 1.0 mWcm⁻² for general population and uncontrolled exposure. 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 structures and body of the user or nearby persons.

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

“ FCC Radiation Exposure Statement:

This equipment complies with FCC’s RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must be installed and operated to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.”