

MPE Analysis Report

The Equipment Under Test (EUT) is a Battery-Free Wireless Door Bell (433.92MHz Transmitter). When the button of the EUT is activated, the corresponding 433.92MHz remote door bell receiver will sound. No battery is needed as the EUT is powered by the electro-motive force generated by the induction coil activated by mechanical bouncing energy at the releasing moment of the push button. The EUT will be deactivated after the button bouncing.

433.92MHz portion:

Modulation Type: OOK (On-Off Keying)

Antenna Type: Integral, Internal

Frequency Range: 433.92MHz, single channel

Antenna gain: 0 dBi

Nominal RF conducted output power: 0 dBm

Maximum allowed field strength of production tolerance: +10 / -15 dB

For Maximum Permissible Exposure (MPE) evaluation of the Battery-Free Wireless Door Bell, 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.

Maximum conducted power is $0\text{dBm} + 10\text{dB} = 10\text{dBm}$ (10mW). The antenna gain is $0\text{ dBi} = 1$ (num gain) 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:

$$\begin{aligned}\text{The radiated (EIRP) source-based time-averaging output power} \\ &= (10 * 1) \text{ mW} \\ &= 10 \text{ mW}\end{aligned}$$

$$\begin{aligned}\text{The power density at 20 cm from the antenna} \\ &= \text{EIRP} / 4\pi R^2 \\ &= 0.002 \text{ mW cm}^{-2}\end{aligned}$$

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 RF Radiation Exposure Statement

Caution: To maintain compliance with the FCC's RF exposure guidelines, place the product at least 20cm from nearby persons.”