

MPE Analysis Report

The Equipment-Under-Test (EUT) 4IE-04-OB-01 and 4IE-02-OB-01 are a Wifi Thermostat. The EUT contains WLAN (Wifi). The EUT can be connected to the server by going to the website through Wifi to the router. The EUT is powered by 100-240VAC.

WiFi Module

Antenna Type: Internal, Integral
Antenna Gain: 4dBi

4IE-04-OB-01 Operating mode	Nominal Conducted Power	Production Tolerance	Modulation Type
802.11b	14.11 dBm	12dBm to 16dBm	DSSS
802.11g	9.53 dBm	7dBm to 11dBm	OFDM
802.11n (HT20)	8.32 dBm	6dBm to 10dBm	mcs0

For Maximum Permissible Exposure (MPE) evaluation of the 4IE-04-OB-01 and 4IE-02-OB-01, 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.

For the WLAN (WiFi), maximum conducted power measured within its production tolerance was 16.68dBm (maximum). The antenna gain is 4 dBi = 2.51 (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:

The conducted power (average) = 16dBm (39.81mW)

$$\begin{aligned} &= (39.81 * 1 * 2.51 \text{ mW}) \\ &= 99.92 \text{ mW} \end{aligned}$$

The power density at 20 cm from the antenna

$$\begin{aligned} &= \text{EIRP} / 4\pi R^2 \\ &= 0.020 \text{ mW cm}^{-2} \end{aligned}$$

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.”

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