

INTERTEK TESTING SERVICES

RF Exposure report

The equipment under test (EUT) is a Baby Monitor - Baby Unit with 2.4GHz wireless control and Bluetooth functions. The EUT is powered by DC5V via micro USB port which can be connected to adapter with 100-240VAC. For more detail information pls. refer to the user manual.

MPE Evaluation for 2.4GHz wireless control function:

Modulation Type: GFSK

Antenna Type: Integral antenna

Antenna Gain: 0dBi

The nominal radiated output power (e.i.r.p) specified: 10dBm (Tolerance: +/-3dB)

The nominal conducted output power specified: 10dBm (Tolerance: +/-3dB)

The maximum radiated emission for the EUT is 105.8dB μ V/m at 3m in the frequency 2.414GHz = $[(FS*D)^2 / 30]$ mW
= 10.57dBm which is within the production variation

The minimum radiated emission for the EUT is 102.6dB μ V/m for at 3m in the frequency 2.468GHz = $[(FS*D)^2 / 30]$ mW
= 7.37dBm which is within the production variation

According to FCC Part 2.1091, this unlicensed transmitting devices is categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use.

For Maximum Permissible Exposure (MPE) evaluation of the product, the maximum power density at 20 cm from this transmitter shall be less than the General Population / Uncontrolled MPE limit in FCC Part 1.1310.

The maximum EIRP= 13.0Bm=19.95mW

The source-based time averaged maximum radiated power = 19.95mW x Duty Cycle = 19.95mW x 5.072% = 1.01mW

Transmitter Duty Cycle Calculation

The duration of one cycle = 100 ms

Effective period of the cycle = 5.072ms

DC = 5.072 ms / 100 ms = 0.05072 or 5.072%

From above 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 65 as follow:

$$= PG/4\pi R^2$$

$$= EIRP/4\pi R^2$$

$$= 1.01mW/ 4\pi R^2$$

$$= 0.0002 \text{ mW/cm}^2$$

The MPE limit is 1.0 mW/cm² for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1310. 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 structure and body of the user or nearby persons.

MPE Evaluation for Bluetooth function:

Modulation Type: GFSK

Antenna Type: PCB antenna

Antenna Gain: 0dBi

The nominal radiated output power (e.i.r.p) specified: -11dBm (Tolerance: +/-4dB)

The nominal conducted output power specified: -11dBm (Tolerance: +/-4dB)

The maximum radiated emission for the EUT is 86.8dB μ V/m at 3m in the frequency 2.402GHz = [(FS*D) ^2 / 30] mW
= -8.43dBm which is within the production variation

The minimum radiated emission for the EUT is 81.2dB μ V/m for at 3m in the frequency 2.440GHz = [(FS*D) ^2 / 30] mW
= -14.03dBm which is within the production variation

According to FCC Part 2.1091, this unlicensed transmitting devices is categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use,

For Maximum Permissible Exposure (MPE) evaluation of the product, the maximum power density at 20 cm from this transmitter shall be less than the General Population / Uncontrolled MPE limit in FCC Part 1.1310.

The maximum EIRP= -7.0dBm=0.2mW

The source-based time averaged maximum radiated power = 0.2mW x Duty Cycle \leq 0.2mW

From above 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 65 as follow:

$$= PG/4\pi R^2$$

$$= EIRP/4\pi R^2$$

$$=0.2mW/ 4\pi R^2$$

$$=0.00004 mW/cm^2$$

The MPE limit is 1.0 mW/cm² for general population and uncontrolled exposure in the 2.4GHz frequency range according to FCC Part 1.1310. 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 structure and body of the user or nearby persons.

Simultaneous transmissions for both 2.4GHz wireless function and Bluetooth function

For Simultaneous transmitting of 2.4GHz wireless control function and Bluetooth function, According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits = $0.0002/1 + 0.00004/1 = 0.00024 < 1$

Since the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in the device is ≤ 1.0 , the EUT is considered to satisfy MPE compliance for simultaneous transmission operations.

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

“FCC RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.”